TEC Thermal Printer

B-450 SERIES

User's Manual

Document No. **EO0-33003A**

Original **Dec., 1998**

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PRINTED IN JAPAN

TOSHIBA TEC CORPORATION

Precaution

This service manual is intended for use by service technicians, and designed as a guide for repair & maintenance. The manual is intended to promote smooth service operations of the product in the market place. It is not intended for any other purpose such as development or product specifications. For questions regarding development or product specifications, please contact the TOSHIBA TEC department in charge.

This manual may be changed or revised without notice. If you find any misprints or omissions, please contact the TOSHIBA TEC Service Solution Planning Dept. (Ohito) promptly (Facsimile No. 0558-76-9842).

TOSHIBA TEC cannot be held responsible for any trouble which have been caused by misprints or omissions.

The following related manuals contain additional specific information on using this model and can be referred to for more detailed information available from TOSHIBA TEC sales headquarters.

- Interface/Communication Manual
- Supply Manual
- Specifications

Safety Summary

Personal safety in handling or maintaining the equipment is extremely important. Warnings and Cautions necessary for safe handling are included in this manual. All warnings and cautions contained in this manual and written inside or outside of the printer should be read and understood before handling or maintaining the equipment.

Never modify the machine. Changes and modifications to the machine is prohibited except for an installation or removal of options, or modifications instructed by Technical Information issued by TOSHIBA TEC Japan. Unauthorized changes or modifications may affect the machine quality or functions, make the machine unconformable to your country's safety standard, or cause personal injury.

Safety Precaution

Electrical equipment is dangerous. Electrical shock from such equipment can cause death. Never operate electrical equipment unless authorized to do so by a responsible authority.
If emergency work on electrical equipment is authorized, be sure that it is performed in strict compliance with approved safety regulations.

The following safety precautions will help to ensure proper use of the printer:

- Turn off the printer before 1) opening the top cover for any reason, 2) attaching/detaching any cable and memory cards, and 3) changing the dip switch setting.
- Disconnect the power cord whenever you are working inside the printer.
- Keep your work environment static free.

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EO0-33003A

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TEC Thermal Printer

B-450-QQ SERIES

Owner's Manual

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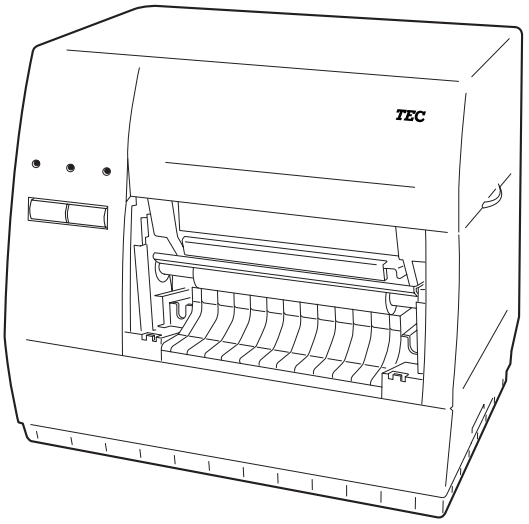

TOSHIBA TEC CORPORATION

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operations of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. (for USA only)

Changes or modifications not expressly approved by manufacturer for compliance could void the user's authority to operate the equipment.

"This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations."

"Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur de Canada."

(for CANADA only)

敬告使用者 ：
這是甲類的資訊產品,在居住的環境中使用時,可能會造成射頻
干擾,在這種情況下,使用者會被要求採取某些適當的對策.

(for QQ, QQ-PAC only)

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Safety Summary

Personal safety in handling or maintaining the equipment is extremely important. Warnings and Cautions necessary for safe handling are included in this manual. All warnings and cautions contained in this manual should be read and understood before handling or maintaining the equipment.
Do not attempt to effect repairs or modifications to this equipment. If a fault occurs that cannot be rectified using the procedures described in this manual, turn off the power, unplug the machine, then contact your authorized TOSHIBA TEC representative for assistance.

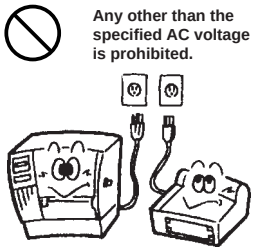
Meanings of Each Symbol

This symbol indicates warning items (including cautions).
Specific warning contents are drawn inside the △ symbol.
(The symbol on the left indicates a general caution.)

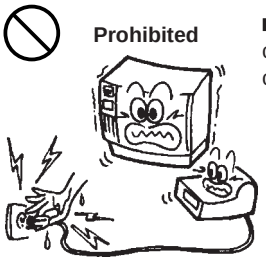
This symbol indicates prohibited actions (prohibited items).
Specific prohibited contents are drawn inside or near the ⃠ symbol.
(The symbol on the left indicates “no disassembling”.)

This symbol indicates actions which must be performed.
Specific instructions are drawn inside or near the ● symbol.
(The symbol on the left indicates “disconnect the power cord plug from the outlet”.)

WARNING This indicates that there is the risk of **death** or **serious injury** if the machines are improperly handled contrary to this indication.



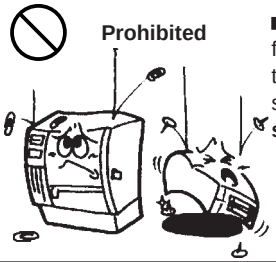
■ Do not use voltages other than the voltage (AC) specified on the rating plate, as this may cause **fire** or **electric shock**.



■ Do not plug in or unplug the power cord plug with wet hands as this may cause **electric shock**.

■ If the machines share the same outlet with any other electrical appliances which consume large amounts of power, the voltage will fluctuate widely each time these appliances operate. Be sure to provide an exclusive outlet for the machine as this may cause the machines to **malfunction**.

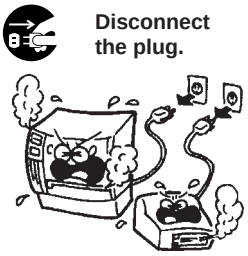
■ Do not place metal objects or water-filled containers such as flower vases, flower pots or mugs, etc. on top of the machines. If metal objects or spilled liquid enter the machines, this may cause **fire** or **electric shock**.



■ Do not insert or drop metal, flammable or other foreign objects into the machines through the ventilation slits, as this may cause **fire** or **electric shock**.

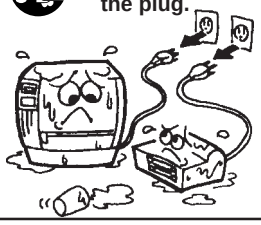
■ Do not scratch, damage or modify the power cords. Also, do not place heavy objects on, pull on, or excessively bend the cords, as this may cause **fire** or **electrical shock**.

■ If the machines are dropped or their cabinets damaged, first turn off the power switches and disconnect the power cord plugs from the outlet, and then contact your authorized TOSHIBA TEC representative for assistance. Continued use of the machine in that condition may cause **fire** or **electric shock**.



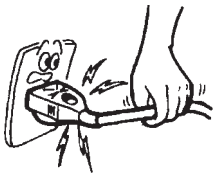
■ Continued use of the machines in an abnormal condition such as when the machines are producing smoke or strange smells may cause **fire** or **electric shock**. In these cases, immediately turn off the power switches and disconnect the power cord plugs from the outlet. Then, contact your authorized TOSHIBA TEC representative for assistance.

Disconnect the plug.



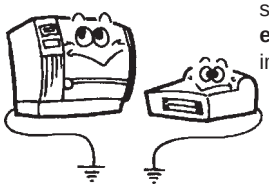
■ If foreign objects (metal fragments, water, liquids) enter the machines, first turn off the power switches and disconnect the power cord plugs from the outlet, and then contact your authorized TOSHIBA TEC representative for assistance. Continued use of the machine in that condition may cause **fire** or **electric shock.**

Disconnect the plug.



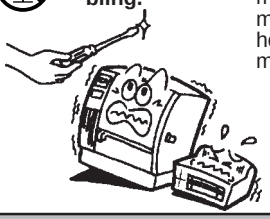
■When unplugging the power cords, be sure to hold and pull on the plug portion. Pulling on the cord portion may cut or expose the internal wires and cause **fire** or **electric shock**.

Connect a grounding wire.



■ Ensure that the equipment is properly grounded. Extension cables should also be grounded. **Fire** or **electric shock** could occur on improperly grounded equipment.

No disassembling.



■ Do not remove covers, repair or modify the machine by yourself. You may be **injured** by high voltage, very hot parts or sharp edges inside the machine.

CAUTION This indicates that there is the risk of personal **Injury** or **damage** to objects if the machines are improperly handled contrary to this indication.

Precautions

The following precautions will help to ensure that this machine will continue to function correctly.

- Try to avoid locations that have the following adverse conditions:
  * Temperatures out of the specification * Direct sunlight * High humidity
  * Shared power source * Excessive vibration * Dust/Gas
- The cover should be cleaned by wiping with a dry cloth or a cloth slightly dampened with a mild detergent solution. NEVER USE THINNER OR ANY OTHER VOLATILE SOLVENT on the plastic covers.
- USE ONLY TOSHIBA TEC SPECIFIED paper and ribbons.
- DO NOT STORE the paper or ribbons where they might be exposed to direct sunlight, high temperatures, high humidity, dust, or gas.
- Ensure the printer is operated on a level surface.
- Any data stored in the memory of the printer could be lost during a printer fault.
- Try to avoid using this equipment on the same power supply as high voltage equipment or equipment likely to cause mains interference.
- Unplug the machine whenever you are working inside it or cleaning it.
- Keep your work environment static free.
- Do not place heavy objects on top of the machines, as these items may become unbalanced and fall causing **injury**.
- Do not block the ventilation slits of the machines, as this will cause heat to build up inside the machines and may cause **fire**.
- Do not lean against the machine. It may fall on you and could cause **injury**.
- Care must be taken not to injure yourself with the printer paper cutter.
- Unplug the machine when it is not used for a long period of time.

Request Regarding Maintenance

- Utilize our maintenance services.
  After purchasing the machine, contact your authorized TOSHIBA TEC representative for assistance once a year to have the inside of the machine cleaned. Otherwise, dust will build up inside the machines and may cause a **fire** or a **malfunction**. Cleaning is particularly effective before humid rainy seasons.
- Our preventive maintenance service performs the periodic checks and other work required to maintain the quality and performance of the machines, preventing accidents beforehand.
  For details, please consult your authorized TOSHIBA TEC representative for assistance.
- Using insecticides and other chemicals
  Do not expose the machines to insecticides or other volatile solvents. This will cause the cabinet or other parts to deteriorate or cause the paint to peel.

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CAUTION:

1. *This manual may not be copied in whole or in part without prior written permission of TOSHIBA TEC.*
2. *The contents of this manual may be changed without notification.*
3. *Please refer to your local Authorized Service representative with regard to any queries you may have in this manual.*

1. INTRODUCTION

Thank you for choosing the TEC B-450 Series thermal/transfer printer. This new generation high performance high quality printer is equipped with the latest hardware including the newly developed high density (11.8 dot/mm, 300 dot/inch) print head. This allows very clear print at a maximum speed of 101.6 mm/sec. (4 inch/sec.). Other standard features include an external paper supply.
Optional features include a strip mechanism and cutter mechanism.
This manual contains general set-up and maintenance information and should be read carefully to help gain maximum performance and life from your printer. For most queries please refer to this manual and keep it safe for future reference.

1.1 APPLICABLE MODEL

- B-452-TS10-QQ
- B-452-TS11-QQ-PAC
- B-452-TS10-QQ-US
- B-452-TS11-US-PAC

Model name description

B - 4 5 2 - T S 1 0 - Q Q - P A C

- Special Code
  US: North America Block
  PAC: with a start up kit
  No description: without a start up kit
- Destination Code
  QQ: Canada, Mexico, etc.
  US: North America Block
- Specification
  10: without Centronics interface and expansion memory
  11,12: with Centronics interface and expansion memory
- Issue mode
  S: Batch
- Resolution
  T: 11.8 dots/mm (300 dpi)
- Thermal direct/Thermal transfer

1.2 ACCESSORIES

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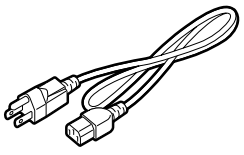
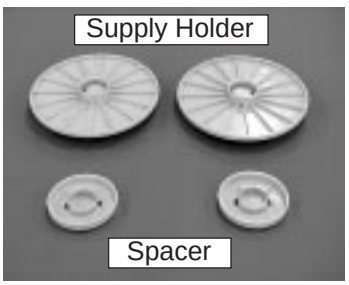
(EO1-33006)

Power Cord

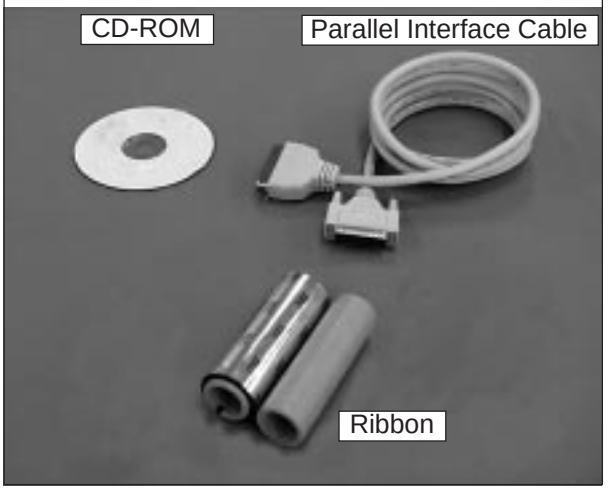


Supply Holder Unit



Start Up Kit

The PAC model also includes the following accessories.



2. SPECIFICATIONS

2.1 GENERAL SPECIFICATIONS

Item \ Model	B-452-TS10-QQ
Supply voltage	100 ~ 120V, 60Hz
Power consumption	0.94 A, 47 W maximum (standby: 0.3 A, 18 W maximum)
Operating temperature	5˚C ~ 40˚C
Relative humidity	25% ~ 85%RH (no condensation)
Dimensions	270 mm (width) x 245 mm (height) x 200 mm (depth), with Supply holder unit 410 mm (depth)
Weight	4.7 kg (without paper and ribbon)

2.2 PRINTING SPECIFICATIONS

Item \ Model	B-452-TS10-QQ
Print head	Thermal print head 11.8 dots per mm (300 dots per inch)
Printing methods	Direct thermal or Thermal transfer
Print speeds	50.8 mm/sec. (2 inch/sec.) for serial barcodes and two-dimensional codes, 101.6 mm/sec. (4 inch/sec.)
Maximum print width	105.7 mm (4.16 inches)
Dispensing modes	Batch (Continuous), Strip (Option) and Cut modes (Option) (Both cut and strip modes are available only when their respective modules are fitted.)
Available bar-code types	JAN8, JAN13, EAN8, EAN8 + 2 digits, EAN8 + 5 digits EAN13, EAN13 + 2digits, EAN13 + 5 digits UPC-E, UPC-E + 2 digits, UPC-E + 5 digits UPC-A, UPC-A + 2 digits, UPC-A + 5 digits MSI, ITF, NW-7, CODE39, CODE93, CODE128 Industrial 2 to 5, UCC/EAN128, Customer bar code, POSTNET RM4SCC, KIX code
Two-dimensional code	Data Matrix, PDF417, QR code, Maxi code
Graphics	All types of graphic files are available when using the windows driver. However, only BMP and PCX files are available when using the programming commands.
Fonts	Times Roman (6 sizes), Helvetica (6 sizes), Presentation (1 size), Letter Gothic (1 size), Prestige Elite (2 sizes), Courier (2 sizes), OCR (2 types), Writable characters, Outline font (7 type) Optional Ture Type Fonts (20 type)
Rotations	0˚, 90˚, 180˚, 270˚
Standard interfaces	Serial interface (RS-232C) Optional parallel interface (Centronics) Optional keyboard interface

* *Data Matrix™ is a trademark of International Data Matrix, Inc.*
PDF417 is a trademark of Symbol Technologies, Inc.
QR code is a trademark of DENSO CORPORATION.
Maxi code is a trademark of United Parcel Service of America, Inc.

2.3 PAPER (LABEL/TAG) SPECIFICATIONS

[Unit: mm]

Item \ Label dispensing mode		Batch mode	Strip mode	Cut mode
Span of one label/tag		15.0 ~ 999.0	25.4 ~ 999.0	Label: 37.0 ~ 999.0 Tag: 25.4 ~ 999.0
Label length		13.0 ~ 997.0	23.4 ~ 997.0	31.0 ~ 993.0
Width including backing paper		25.4 ~ 114.0		
Label width		22.4 ~ 111.0		
Gap length		2.0 ~ 20.0	2.0 ~ 20.0	6.0 ~ 20.0
Black mark length (Tag paper)		2.0 ~ 20.0		
Effective print width		10.0 ~ 105.7		
Effective print length	Label	15.0 ~ 500.0		
	Tag	15.0 ~ 500.0		
Print speed up/slow down area		1.0		
Black mark length (Label)		MIN. 2.0		
Outer roll diameter		MAX. ø152.4 (Paper Core ø38, 40, 42 or 76.2)		
Thickness		0.1 ~ 0.17	0.13 ~ 0.17	0.1 ~ 0.17

2.4 RIBBON SPECIFICATINS

Type	Spool type
Width	60 mm ~ 110 mm
Length	(300 m)
Outer diameter	Ø65 mm (max.)

NOTES: *1. To ensure good print quality and maximum print head life use only TOSHIBA TEC specified paper and ribbons.*

2. For further information about paper and ribbon, refer to Section 10. CARE/HANDLING OF THE PAPER AND RIBBON.

2.5 OPTION

Option Name	Type	Use
Cutter module	B-7204-QM	This cutter module uses a rotary cutter. It cuts backing paper of labels and tag paper automatically in "stop and cut" mode.
Strip module	B-7904-H-QM	This strip module strips the label from the backing paper with the take-up block and strip block. When the rewinder guide plate is attached, the tag paper and label with backing paper are wound.
Programmable Keyboard module	KB-80-QM	This module is an external intelligent keyboard unit.
Expansion I/O interface board	B-7704-IO-QM	Installing this board in the printer allows a connection with an external device with the exclusive interface, such as the Keyboard module.
Centronics interface board	B-7704-C-QM	Installing this board in the printer allows a connection with a PC by the Centronics parallel interface.
LAN I/F Board (TS model only)	B-7704-LAN-QM	This board enables the printer to be used in a LAN network by using the command language.

NOTE: *To purchase the OPTIONAL KIT, please contact your authorized TOSHIBA TEC representative or TOSHIBA TEC Head Quarter.*

3. APPEARANCE

3.1 FRONT/REAR VIEW

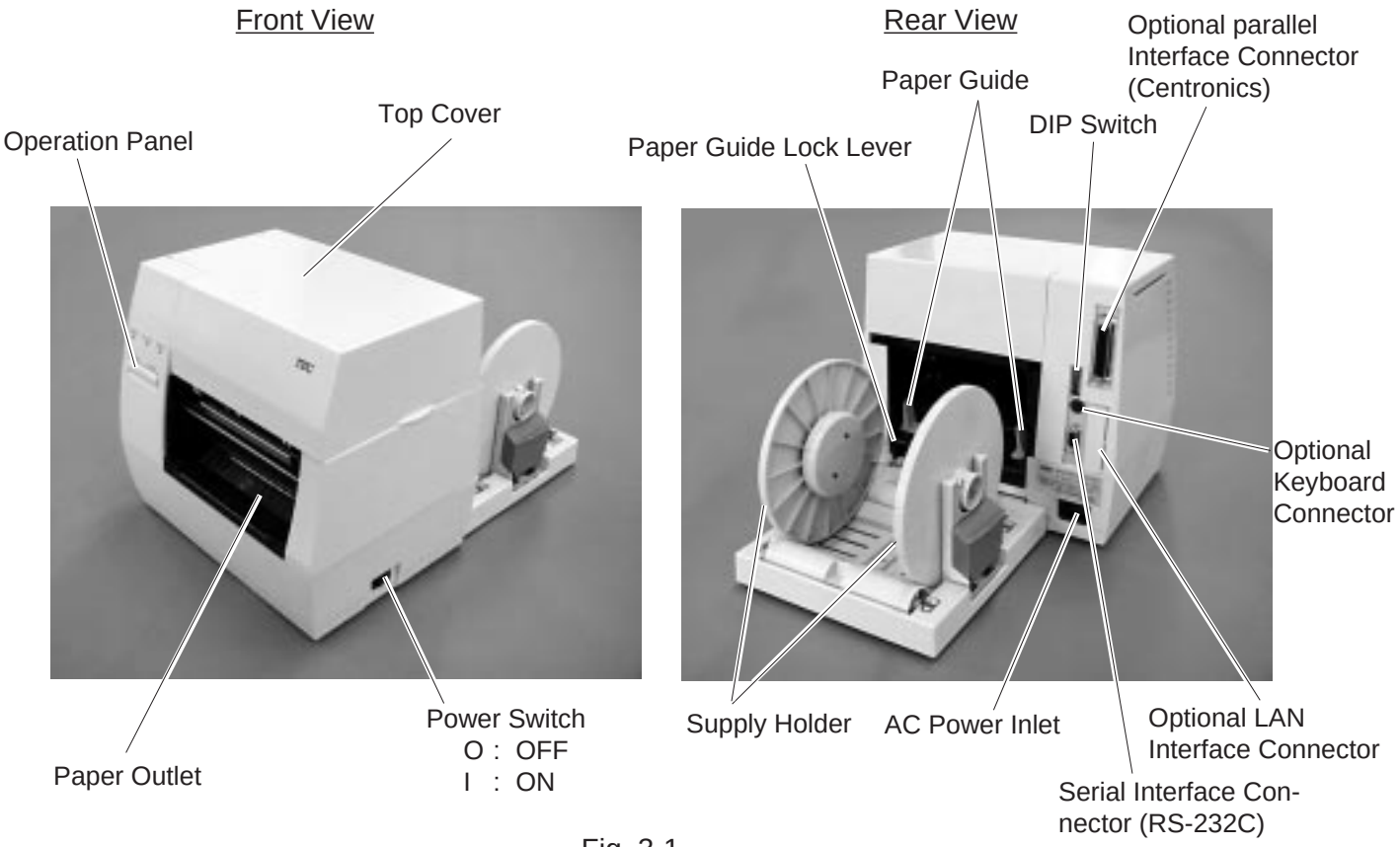


Fig. 3-1

3.2 OPERATION PANEL

Fig. 3-2

POWER LED (Green)
Lights when the power is turned on.

ON-LINE LED (Green)
1) Flashes when communicating with a host computer.
2) On while printing.

ERROR LED (Red)
Lights when a communication error occurs, when the paper/ribbon ends or the printer is not operating correctly.

FEED Key
Feeds paper.

PAUSE Key
Pauses printing.
Resets the printer when paused or when an error occurs.

4. DIP SWITCH FUNCTIONS

The DIP switches are located at the rear of the printer.

WARNING!
Turn the POWER OFF before changing the DIP switches.

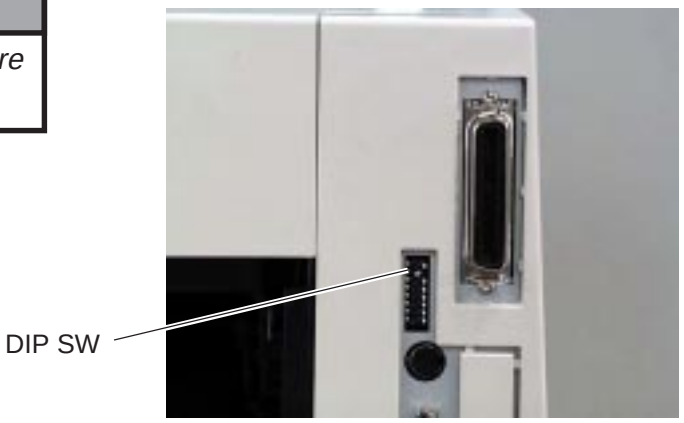


Fig. 4-1

DIP SW

No.	ON/OFF		Function	Remarks
	1	2		Transmission speed (Baud rate)
1	OFF	OFF	2400 bps	
	ON	OFF	4800 bps	
2	OFF	ON	9600 bps	
	ON	ON	19200 bps	
3	OFF		None	Parity
	ON		EVEN	
4	OFF		Not available	Stacker
	ON		Available	
5	OFF		Available	Auto media feed
	ON		Not available	
	6	7		Selectable only when DIP SW #8 is ON.
6	OFF	OFF	RAM clear mode (Maintenance counter)	
	ON	OFF	Threshold manual setting mode	
7	OFF	ON	Sensor adjustment mode	
	ON	ON	RAM clear mode (Parameter)	
8	OFF		Normal operation mode	Operating mode
	ON		Program down load operation	

NOTES: *1. DIP Switch settings are read at power on time.*

2. To enter the program download mode first set DIP SW #8 to ON. The printer will then enter the relevant modes, as selected by DIP SWS #6 and #7. To initialise these modes hold down the ***[FEED]*** *or* ***[FEED]*** *and* ***[PAUSE]*** *keys whilst turning the power on. If the printer is turned on without pressing a key, it will enter the program download mode. Do not set the switches to the maintenance mode as this may cause a failure.*

3. When DIP SW#8 is set to OFF, the backing paper thickness setting can be changed by the following combination of DIPSWs #6 and #7.

No.6	No.7	Thickness of Backing Paper
OFF	OFF	70µm Thin Backing Paper
ON	OFF	80µm Thick Backing Paper

5. SET UP PROCEDURE

5.1 REQUIREMENTS FOR OPERATION

This machine has the following requirements:

- The host computer must have a serial port or centronics parallel port.
- To communicate with host, either an RS-232C cable or Centronics cable is required.
  (1) RS-232C cable .....9 pins
  (2) Centronics cable .....36 pins
- To print a label format, create the complete program using the interface/communication manual.

■ Interface Cables

To prevent radiation and reception of electrical noise, the interface cables must meet the following requirements:

- Fully shielded and fitted with metal or metalized connector housings.
- Kept as short as possible.
- Should not be bundled tightly with power cords.
- Should not be tied to power line conduits.

■ RS-232C Cable description

The serial data cable used to connect the printer to the host computer should be one of the following two types:

NOTE: *Use an RS-232C cable with imperial (inch) connector securing screws.*

DB-9S
Connector to PC

PIN No.	Signal
1	N.C.
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	N.C.
Housing	Shield

DB-9P
Connector to Printer

PIN No.	Signal
1	N.C.
2	TXD
3	RXD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS
9	N.C.
Housing	Shield

DB-25S
Connector to PC

PIN No.	Signal
1	Shield
2	TXD
3	RXD
4	RTS
5	CTS
6	DSR
7	GND
20	DTR

DB-9P
Connector to Printer

PIN No.	Signal
1	N.C.
2	TXD
3	RXD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS
9	N.C.

Fig. 5-1

5.2 SETTING UP THE PRINTER

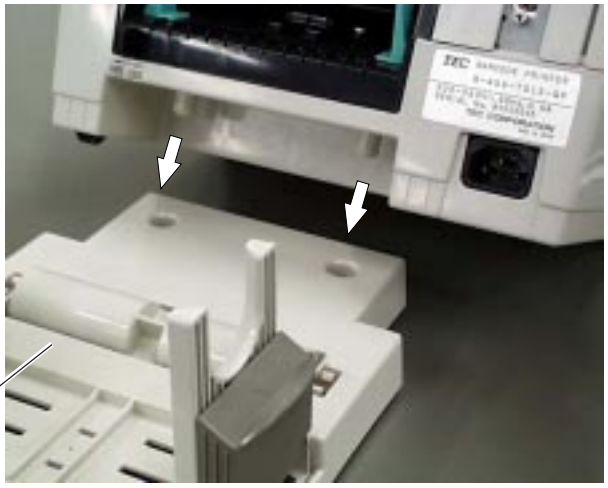
- Place the printer on a flat, stable surface.
- Use a grounded electrical outlet do not use adapter plug.
- Be sure there is adequate room around the printer for easy operation and maintenance.
- Keep your work environment static free.

6. INSTALLATION PROCEDURE

6.1 INSTALLING THE SUPPLY HOLDER UNIT

WARNING!
Turn the power OFF before installing the supply holder unit.

Fit the two studs on the bottom of the printer into the holes in the supply holder unit.

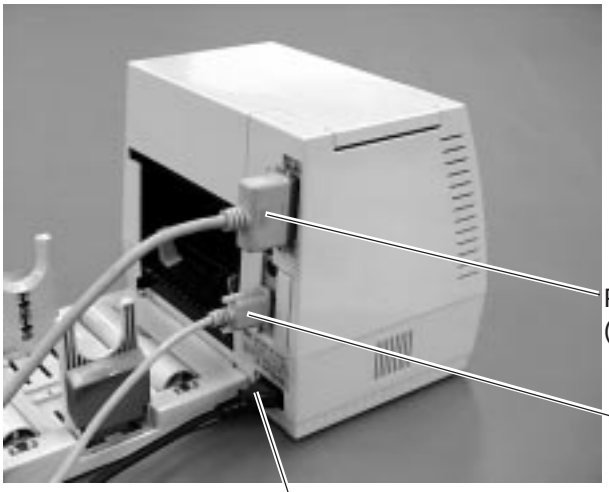


Supply Holder Unit

Fig. 6-1

6.2 CONNECTING THE POWER CORD AND CABLES

WARNING!
*Turn the **POWER SWITCH to OFF** before connecting the power cord or cables.*



Parallel Interface Cable (Centronics)

Serial Interface Cable (RS-232C)

Power Cord

Fig. 6-2

7. LOADING THE RIBBON

The printer is capable of printing in both direct thermal and thermal transfer modes.

DO NOT LOAD a ribbon when using a direct thermal paper.

1. Turn the power off and open the top cover.
2. Move the head release lever toward the front of the printer and raise the print head block.

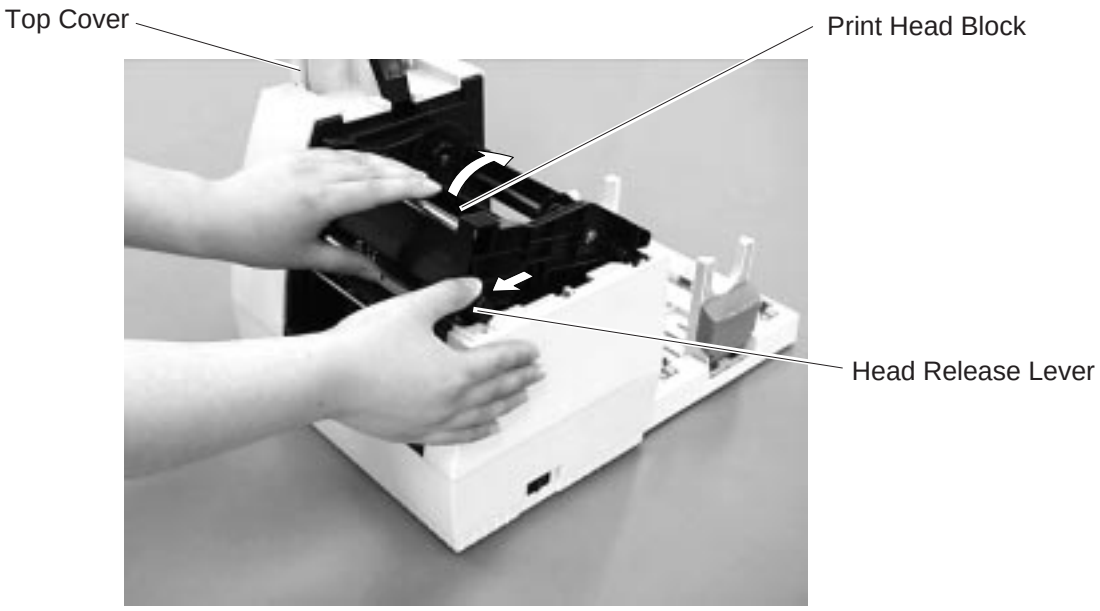


Fig. 7-1

3. Fit the protrusion of the guide wheel into the notch of the ribbon core (take-up side).
4. Pull the knob and set the ribbon core to the spring guide wheel.

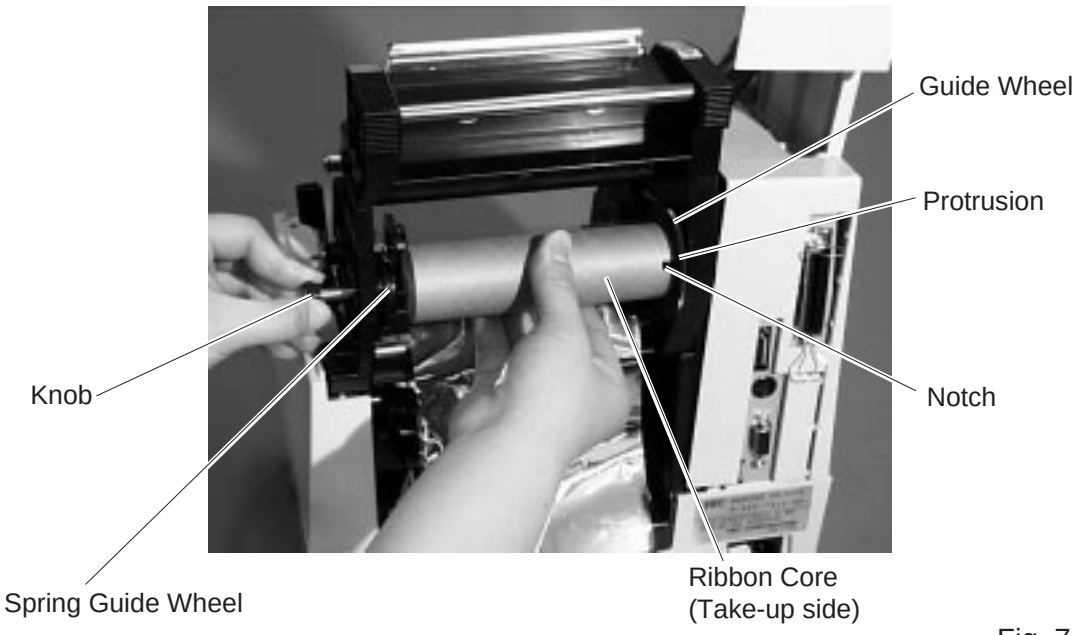


Fig. 7-2

5. Set the ribbon core (supply side) by fitting the protrusion into the notch.

Fig. 7-3

6. Turn the guide wheel in the arrow-indicating direction to remove any slack of the ribbon.

NOTE: *Make sure that the ribbon has no wrinkles and the protrusions are fitted into the notches of the ribbon cores.*

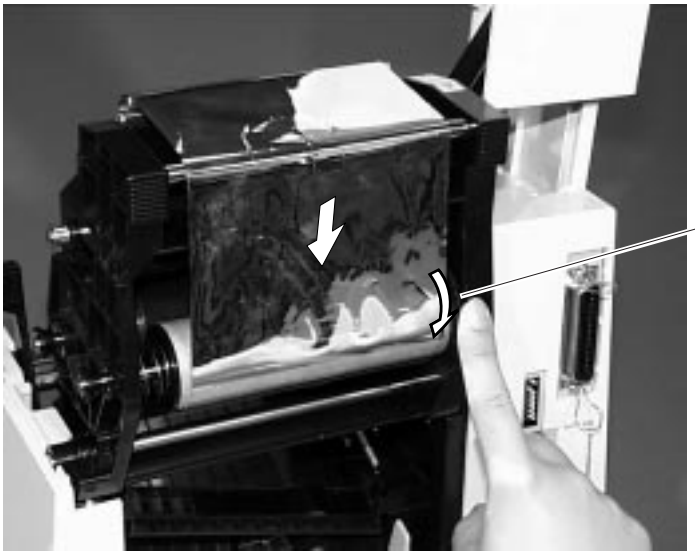


Fig. 7-4

8. LOADING THE PAPER

This supply holder accepts four sizes of label core: 38 mm, 40 mm, 42 mm and 76.2 mm.
When using a paper roll of 38 mm, 40 mm or 42 mm, remove the spacers from the supply holders using the following procedure.

1. Push both hooks of the spacer to remove it from the supply holder. Keep the removed spacers safe.

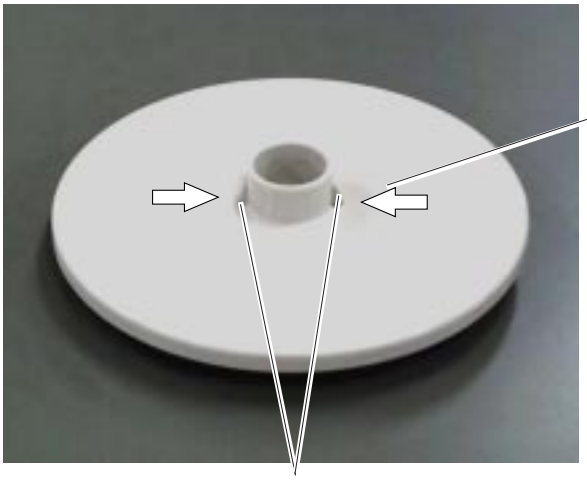


Fig. 8-1

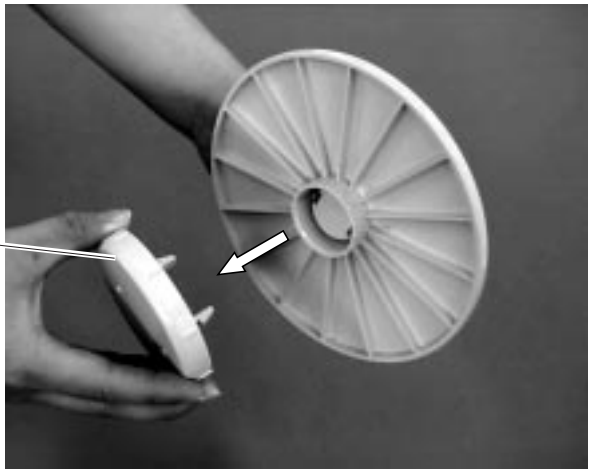


Fig. 8-2

2. Set the supply holders to both sides of the paper roll.

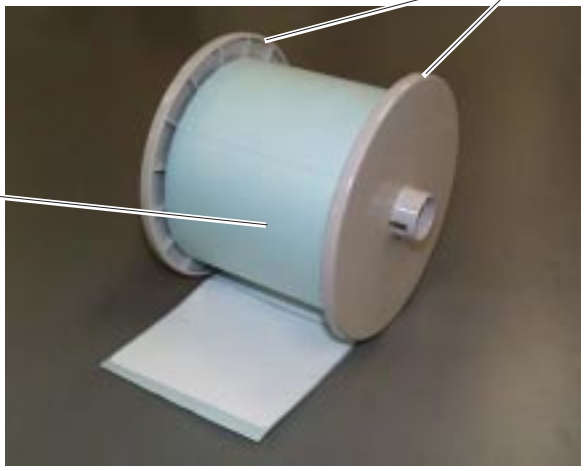


Fig. 8-3

3. Put the paper roll and supply holders on the supply holder unit.

NOTE: *Paper may be wound outside or inside. Regardless of the paper roll, the paper must be loaded so that the print side faces upward.*

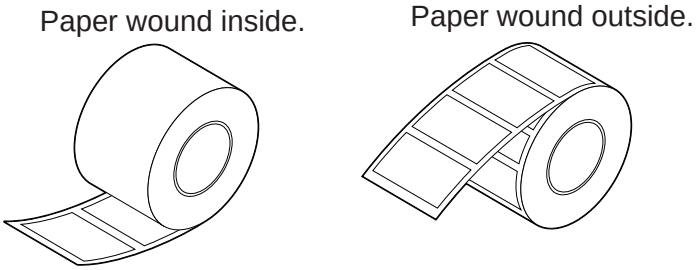


Fig. 8-4

4. Push both sides of the supply holder guides against the paper roll, then lock them with the lock lever.

NOTE: *Make sure that the supply holders rotate slightly.*

5. Pass the paper through the printer until it is past the paper outlet.

6. Adjust the position of the paper guides to the paper width, then lock them with the lock lever.

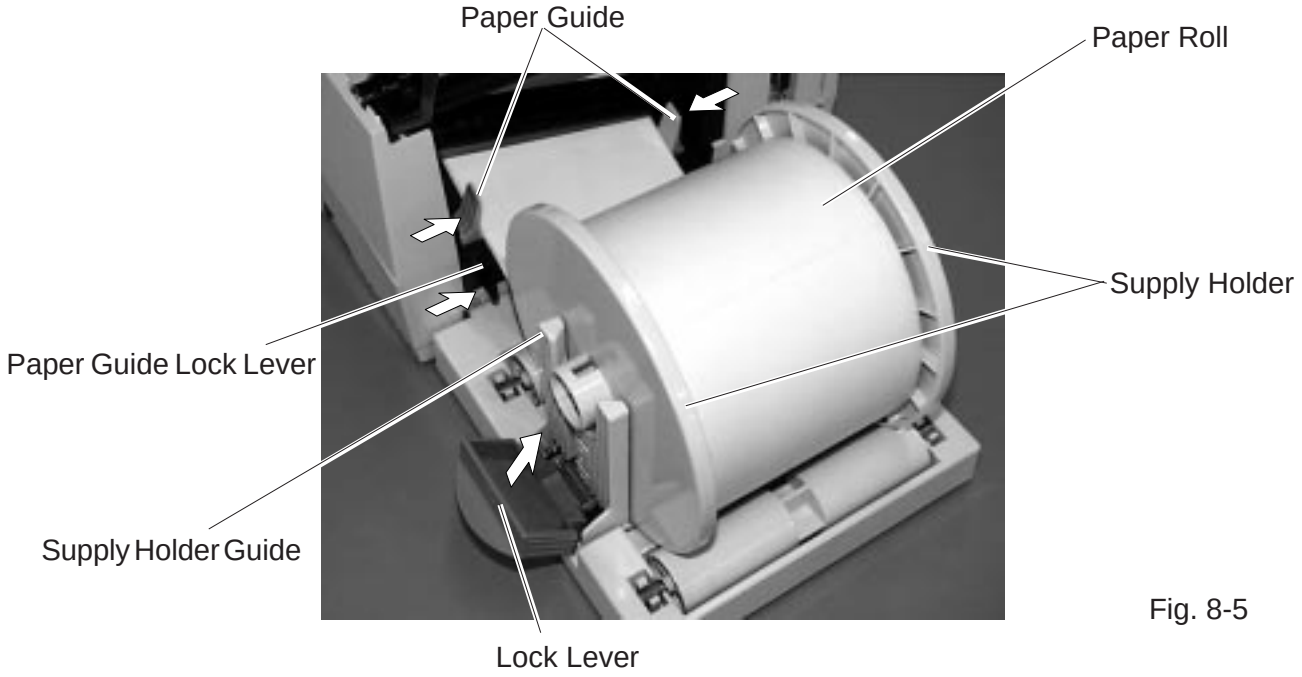


Fig. 8-5

7. Close the print head block by pressing both sides of the print head block's top until it clicks.

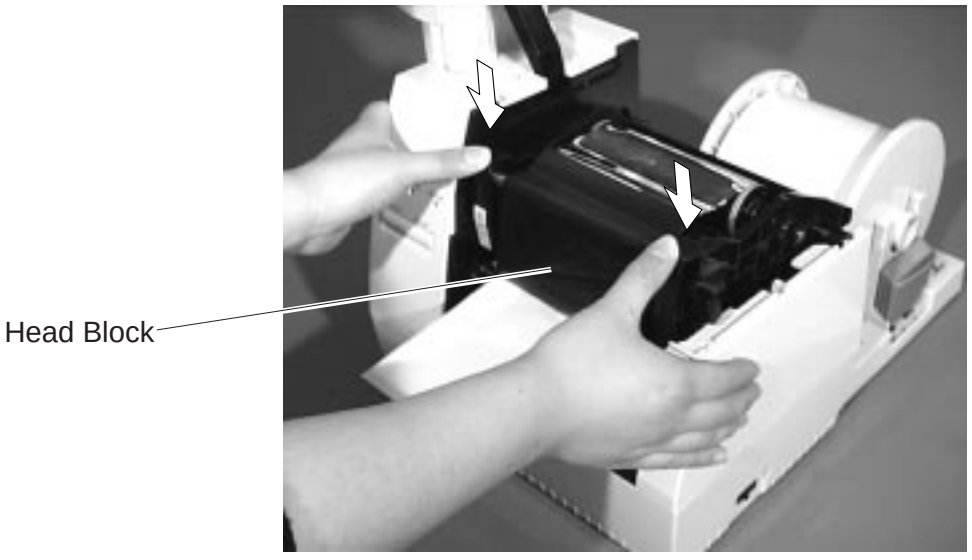


Fig. 8-6

NOTE: *Pass the paper straight from the supply holder to paper outlet. Failure to do this may cause skew feeding or paper jam.*

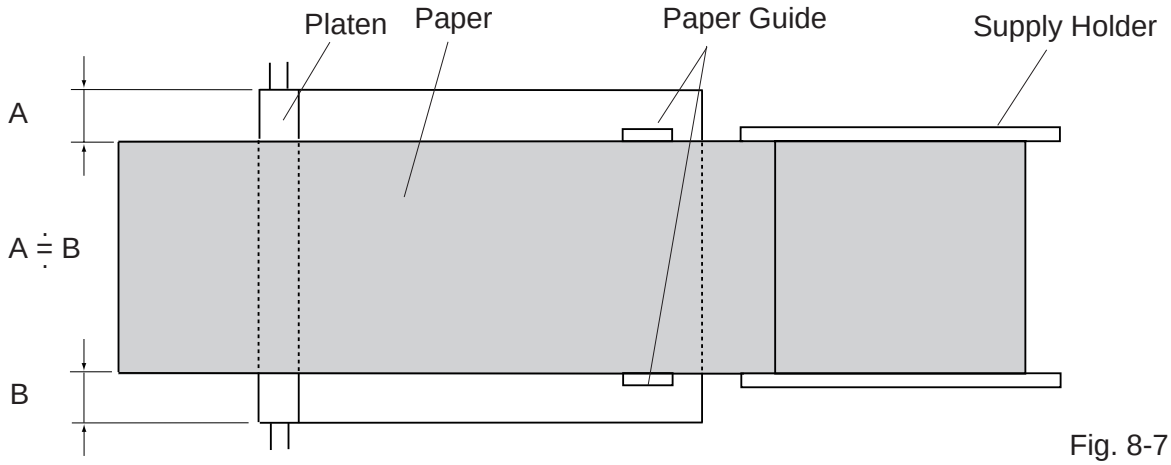


Fig. 8-7

8. Close the top cover. Paper loading is now completed.

Batch type:

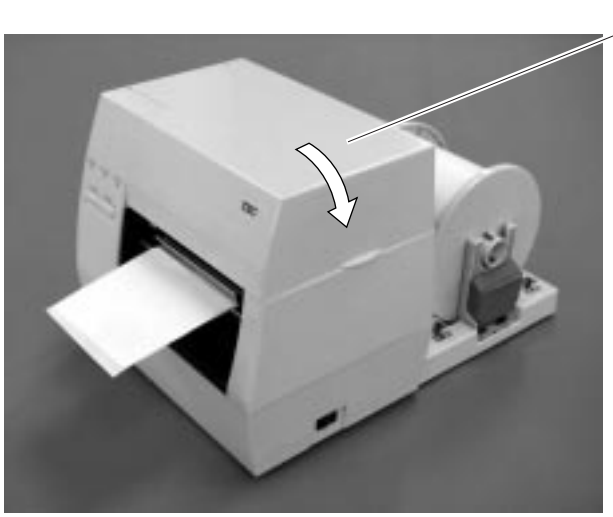


Fig. 8-8

Cutter type: Where a cutter is fitted load the paper as standard and feed it through the cutter module.

NOTES: *1. When using the cutter, be sure to cut the backing paper between the labels. Cutting on the label will cause the glue to stick to the cutter, which may affect the cutter quality and shorten it's life.*

2. Use of tag paper that exceeds the specified thickness may affect the cutter life.

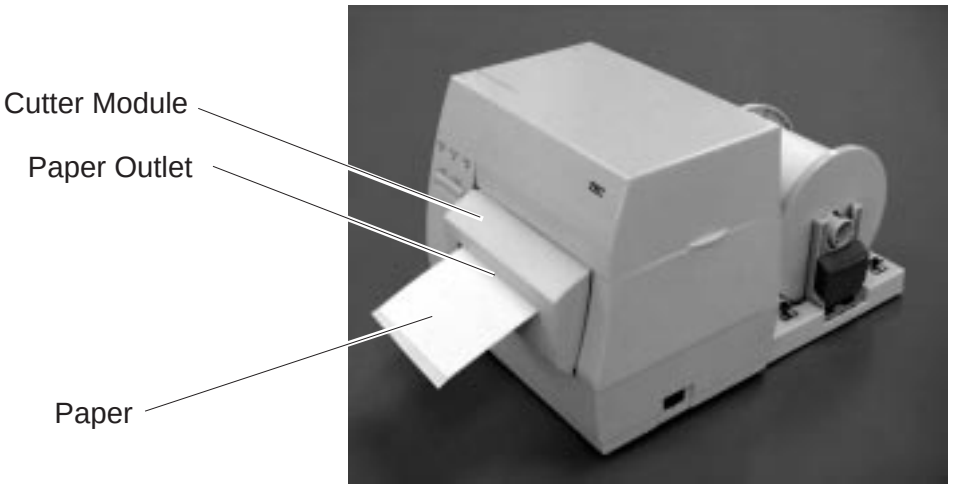


Fig. 8-9

Strip type:

① Strip the labels from the backing paper for about 200-mm long from the top edge of the label roll.

② First push the strip lever toward the printer to release the hook, and then pull the strip lever.

③ Pass the backing paper between the strip roller and the strip guide roller. After taking up any slack of the paper, set the strip lever in position.

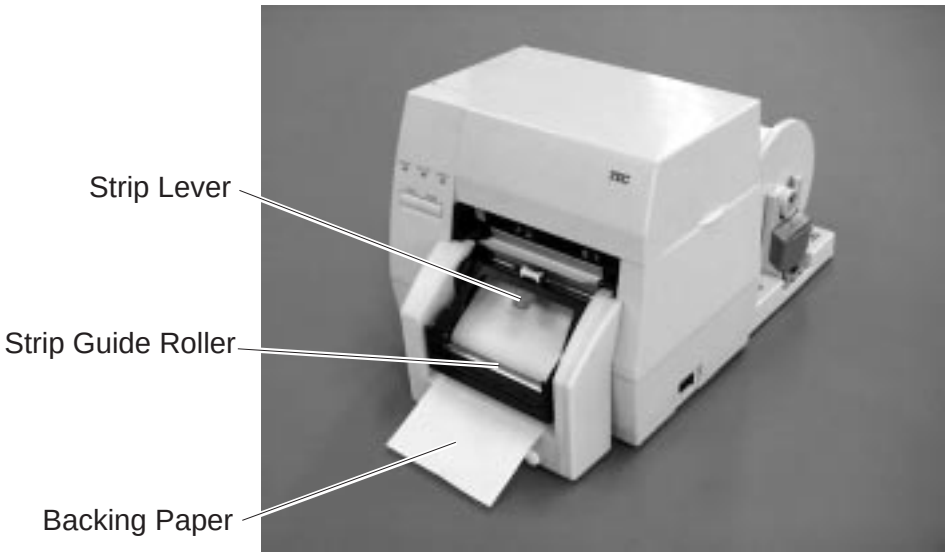
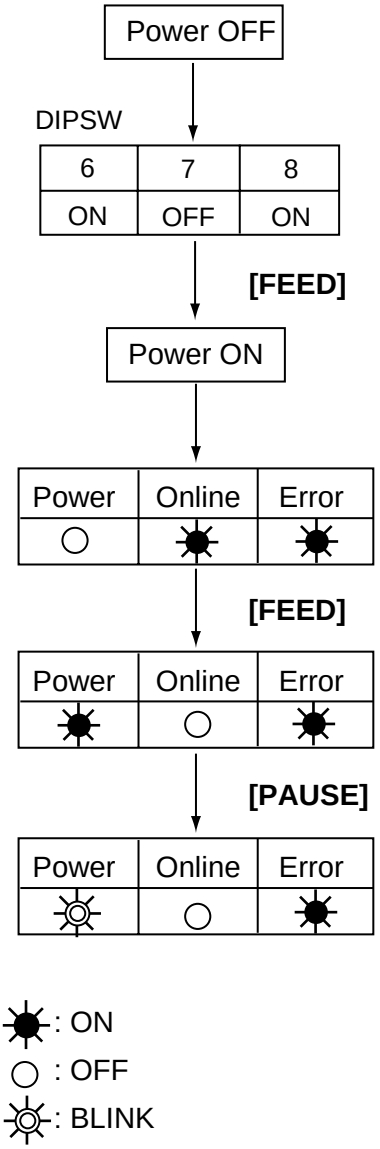


Fig. 8-10

9. THRESHOLD SETTING

For the printer to maintain a constant print position it uses the transmissive sensor to measure the amount of light passing through the gap between labels. When the paper is pre-printed, the darker (or more dense) inks can interfere with this process causing paper jam errors. To eliminate this problem a minimum threshold can be set for the sensor in the following way.



(1) The power is off.

(2) Set the DIP switches to enter the manual threshold setting mode.

(3) Turn the power ON while pressing and holding the **[FEED]** key.

The transmissive sensor is selected.

(4) Press the **[FEED]** key.

The reflective sensor is selected.
The sensor type is switched by pressing the **[FEED]** key. Load the pre-printed label roll in the usual way.

(5) Press and hold the **[PAUSE]** key.
The paper will feed through the printer until the **[PAUSE]** key is released. Release the **[PAUSE]** key after more than 1.5 labels have been fed.
(Threshold setting is completed by this operation.)

(6) Turn the power OFF.

NOTES: *1. To set the threshold properly, be sure to feed more than 1.5 labels. Insufficient paper feeding may result in an incorrect threshold setting. In this case, repeat the procedure.*
*2. While the print head is raised, the **[PAUSE]** key does not work.*
3. If the paper runs out or a cutter error occurs, it will not be detected during the paper feed.
4. If the printer does not print in the correct position even after the threshold setting, the transmissive sensor adjustment may be wrong. In this case, re-adjust the transmissive sensor, and then set the threshold again. (When the backing paper is thick, the transmissive sensor adjustment is required.)

10. CARE/HANDLING OF THE PAPER AND RIBBON

CAUTION:

Be sure to read carefully and understand the Supply Manual. Ask your nearest authorized TOSHIBA TEC representative for the Supply Manual. Use only paper and ribbon which meet specified requirements. Use of non-specified paper and ribbon may shorten the head life and result in problems with bar code readability or print quality. All paper and ribbon should be handled with care to avoid any damage to the paper, ribbon or printer. Read the following guideline carefully.

- Do not store the paper and ribbon for longer than the manufactures recommended shelf life.
- Store paper rolls on the flat end, do not store them on the curved sides as this might flatten that side causing erratic media advance and poor print quality.
- Store the paper in plastic bags and always reseal after opening. Unprotected paper can get dirty and the extra abrasion from the dust and dirt particles will shorten the print head life.
- Store the paper and ribbon in a cool, dry place. Avoid areas where they would be exposed to direct sunlight, high temperature, high humidity, dust or gas.
- The thermal paper used for direct thermal printing must not have the specifications which exceed Na^+ 800 ppm, K^+ 250 ppm and CL^- 500 ppm.
- Some ink used on pre-printed labels may contain ingredients which shorten the print head's product life. Do not use labels pre-printed with ink which contain hard substances such as carbonic calcium ($CaCO_3$) and kaolin (Al_2O_3, $2SiO_2$, $2H_2O$).

For further information please contact your local distributor or your paper and ribbon manufacturer.

11. GENERAL MAINTENANCE

WARNING!

Be careful when handling the print head as it becomes very hot.

11.1 CLEANING

WARNING!

1. *Be sure to disconnect the power cord prior to performing any maintenance.*
2. *DO NOT POUR WATER directly onto the printer.*

CAUTION:

1. *Do not use any sharp objects to clean the print head and platen. Doing so may damage them, causing poor print quality or missing dots.*
2. *Never use a organic solvents like thinners or venzene for cleaning. Using such solvents may discolor the covers, cause poor print quality, or printer failure.*
3. *Do not touch the print head element as static build-up may damage the print head.*

To help retain the high quality and performance of your printer it should be regularly cleaned. The greater the usage of the printer, the more frequent the cleaning. (i.e. low usage=weekly : high usage=daily).

1. Turn the power off.
2. Open the top cover.
3. Turn the head lever to raise the print head.
4. Remove the ribbon and paper.
5. Clean the print head element with print head cleaner

NOTE: *Please purchase the print head cleaner from the authorized TOSHIBA TEC service representative.*

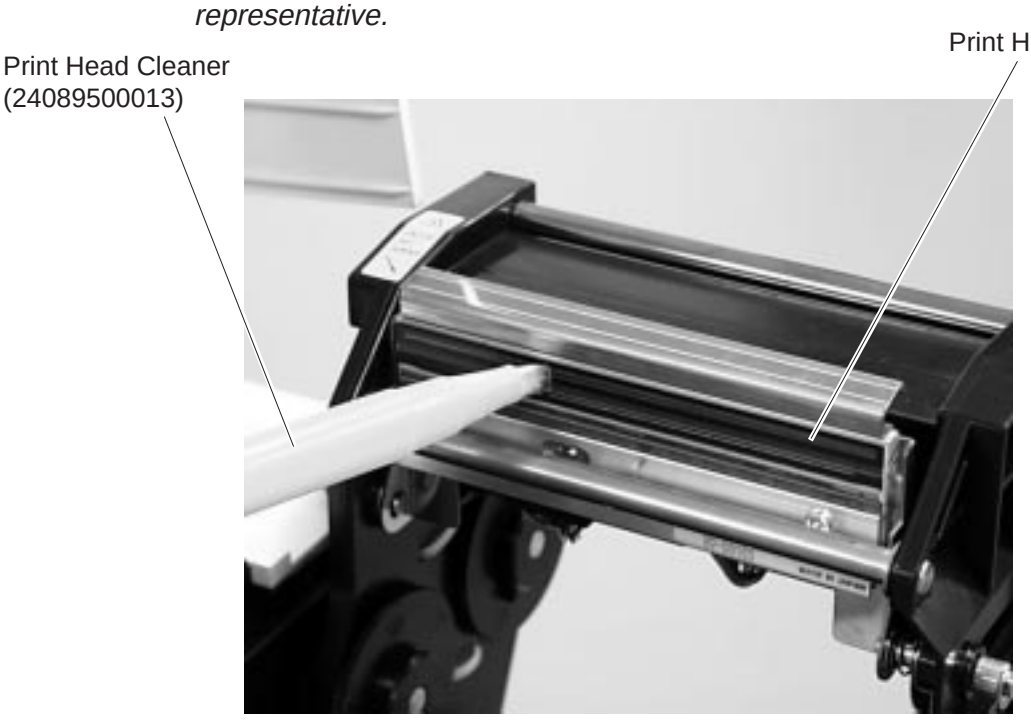


Fig. 11-1

6. Clean the platen with a cloth moistened with alcohol.
7. Remove any dust or glue from the detection area of the sensors and paper path with a soft cloth.

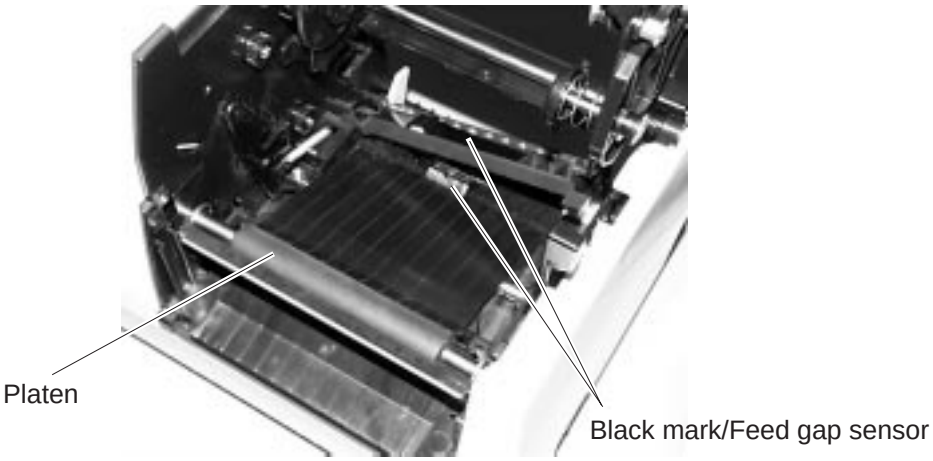


Fig. 11-2

8. Remove the supply holder rollers from the supply holder unit. Remove any dust from the recessed portions of the base and wipe glues from the rollers with a slightly moistened soft cloth.

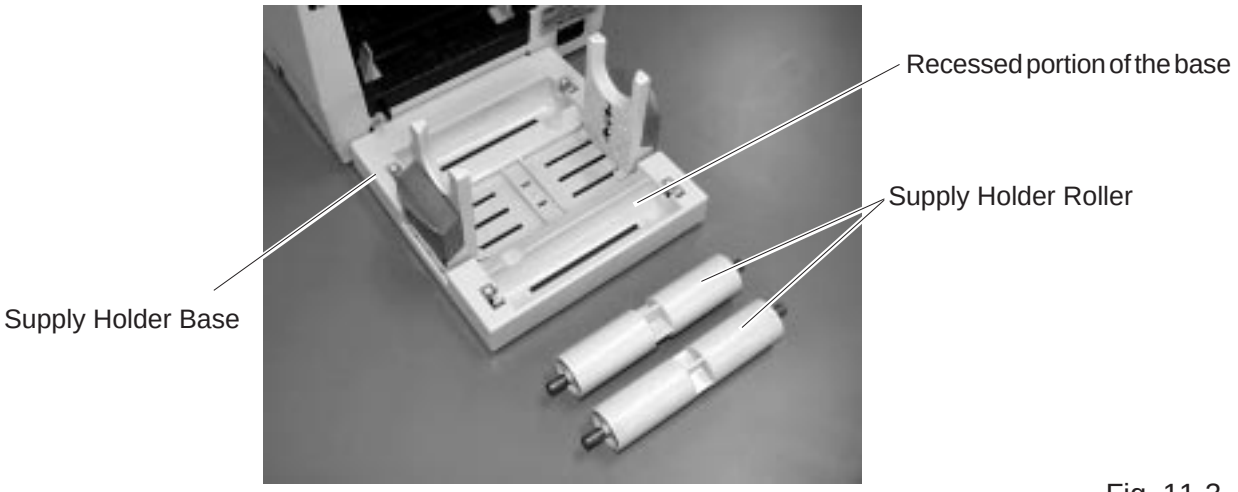


Fig. 11-3

11.2 COVERS

The covers should be cleaned by wiping with a dry cloth or a cloth slightly dampened with a mild detergent solution.

NOTE: *Clean printer cover with an electrostatic free cleaner for automated office equipment.*

WARNING!
1. DO NOT POUR WATER directly onto the printer. *2. DO NOT APPLY cleaner or detergent directly onto any cover.* *3. NEVER USE THINNER OR OTHER VOLATILE SOLVENT on the plastic covers.* *4. DO NOT clean the covers with alcohol as it may cause them to discolor, loose their shape or develop structural weakness.*

11.3 REMOVING JAMMED PAPER

1. Turn the power off.
2. Open the top cover.
3. Move the head release lever toward the front of the printer to raise the print head block.
4. Remove the ribbon and paper.
5. Remove the jammed paper. DO NOT USE any sharp implement or tool as these could damage the printer.
6. Clean the print head and platen, then remove any further dust or foreign substances.

Fig. 11-4

7. Paper jams in the cutter unit can be caused by wear or residual glue from label stock on the cutter. Do not use unspecified paper in the cutter. If frequent jams occur in the cutter contact your Authorized Service representative.

■ Cleaning the Cutter Unit

WARNING!
1. Be sure to disconnect the power cord before cleaning the cutter unit. *2. The cutters are sharp and care should be taken not to injure yourself when cleaning.*

1. Press the cutter cover release lever to detach the cutter cover.

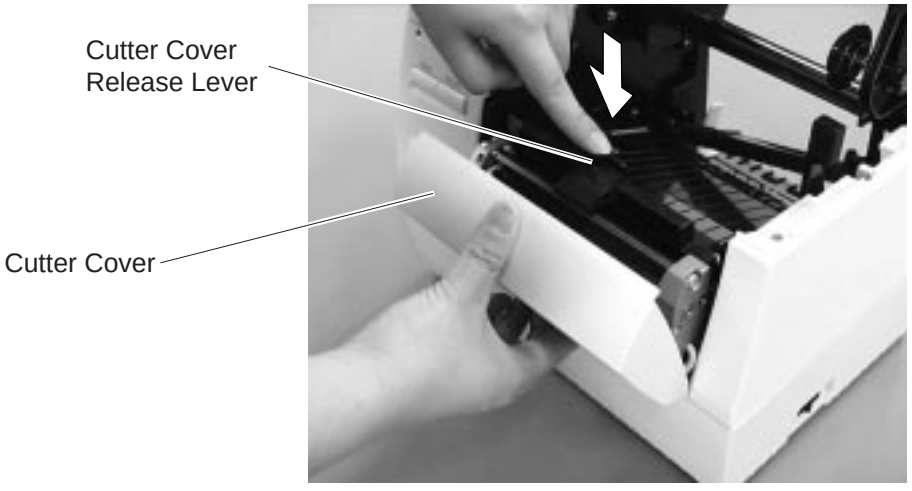


Fig. 11-5

2. Fit the enclosed Allen Key into the right side of the cutter unit to rotate the cutter manually. Remove the jammed paper and any paper particles from the cutter.
3. Clean the cutter with dry cloth.

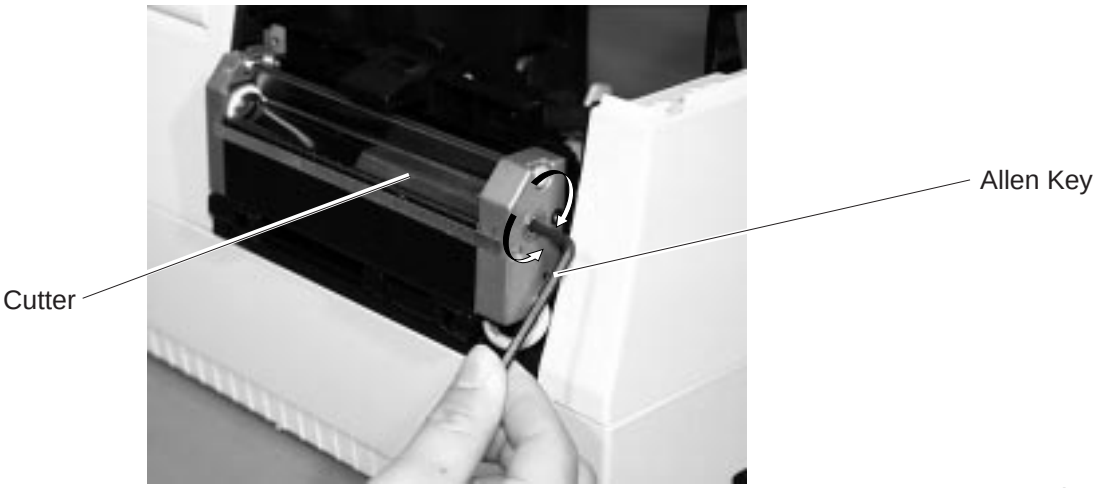


Fig. 11-6

4. Assembling is reverse order of removal.

■ Cleaning the Strip Unit

WARNING!
1. Be sure to disconnect the power cord before cleaning the strip unit. *2. Do not touch the moving parts. To reduce the risk that fingers, jewelry, clothing, etc., be drawn into the moving parts, push the switch in the "OFF" position to stop movement.*

1. First push the strip lever toward the printer to release the hook, and then pull the strip lever.
2. Remove the jammed paper, if any.
3. Clean the strip guide rollers A and B with a cloth moistened with alcohol.

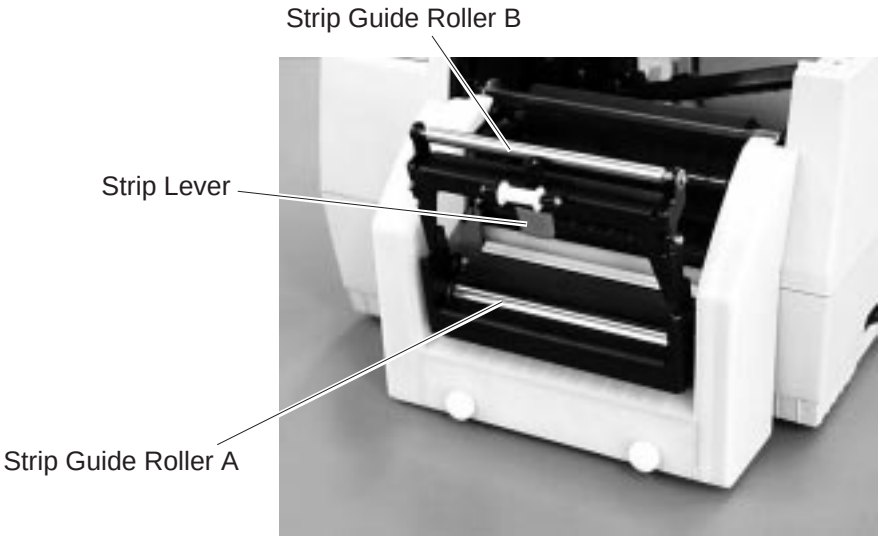


Fig. 11-7

12. TROUBLESHOOTING

WARNING!

If you cannot solve a problem with the following solutions, do not attempt to repair it yourself. Turn the power off, unplug the printer, then contact your TOSHIBA TEC representative for assistance.

If the error lamp lights during printing, refer to the following troubleshooting to solve the problem.

Error type	Problem	Solution
PAPER JAM	1. The paper is not fitted correctly.	1. Reload the paper correctly. → Press the **[PAUSE]** key.
	2. The paper path is jammed and does not feed smoothly.	2. Remove the cause of the jam and replace the paper correctly. → Press the **[PAUSE]** key.
	3. The installed paper type does not match the selected sensor.	3. Turn the power off then on again. Select the correct sensor. → Feed the paper.
	4. The installed paper size is different from the programmed size.	4. Turn the power off then on again. Set the correct paper size. → Feed the paper.
	5. The feed gap sensor cannot see the difference between the print area and the gap.	5. Set the threshold (see page 9-1). Else Turn the power off and call your Authorized Service representative.
HEAD OPEN	Feeding or printing has been attempted while the print head is raised.	Lower the print head block. → Press the **[PAUSE]** key.
NO PAPER	The paper has run out.	Load new paper. → Press the **[PAUSE]** key.
EXCESS HEAD TEMP.	The print head is too hot.	Turn the power off and decrease the print head temperature.
RIBBON ERROR	1. The ribbon has run out.	1. Load a new ribbon. → Press the **[PAUSE]** key.
	2. There is a fault with the ribbon sensor.	2. Turn the power off and contact your Authorized Service representative.

Error type	Problem	Solution
CUTTER ERROR	Paper is jammed in the cutter.	Remove the jammed paper and feed the undamaged media through the cutter (See page 11-3). → Press the **[PAUSE]** key. Else Turn the power off and contact your Authorized Service representative.
Other Error	Hardware or software trouble.	Turn the power off then on again. If the problem still exists turn the power off and contact your Authorized Service representative.
NOTE: *If an error cannot be cleared by pressing the **[PAUSE]** key, the power must be switched off then on again.* *Once the power has been switched off and on, all the print data in the printer is cleared.*		

Problem	Solution
No print.	1. Check that the paper and ribbon are loaded correctly. 2. Check that print head is set correctly. 3. Check the cabling between the printer and the host.
Dots missing in the print.	Dirty print head. → Clean the print head. Call your Authorized Service representative if necessary.
Unclear (or blurred) printing.	1. Dirty print head. → Clean the print head. 2. Bad or faulty ribbon. → Replace ribbon. 3. Poor paper quality. → Change paper type.
Power does not come on.	1. Plug power cord into an AC socket. 2. Check the circuit breakers or fuses. 3. Plug another appliance into the AC socket to check if there is power supplied. Call your Authorized Service representative if necessary.
Printer does not cut.	Check for a paper jam in the cutter. Call your Authorized Service representative if necessary.
You see a raised nap where the paper has been cut.	1. Clean the cutter blades. 2. The blades are worn. → Call your Authorized Service representative.

APPENDIX

■ ASCII Code Chart

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	≠		ð	Ó	—
1			!	1	A	Q	a	q	ü	æ	í	≠		Ð	ß	±
2			"	2	B	R	b	r	é	Æ	ó			Ê	Ô	=
3			#	3	C	S	c	s	â	ô	ú			Ë	Ò	¾
4			$	4	D	T	d	t	ä	ö	ñ			È	õ	¶
5			%	5	E	U	e	u	à	ò	Ñ	Á		ı	Õ	§
6			&	6	F	V	f	v	å	û	✦	Â	ã	Í	µ	÷
7			'	7	G	W	g	w	ç	ù	◷	À	Ã	Î	þ	¸
8			(	8	H	X	h	x	ê	ÿ	¿	©		Ï	Þ	°
9			)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A			*	:	J	Z	j	z	è	Ü	¬				Û	·
B			+	;	K	[	k	{	ï	ø	½				Ù	¹
C			,	<	L	\	l	|	î	£	¼				ý	³
D			–	=	M	]	m	}	ì	Ø	¡	¢		¦	Ý	²
E			.	>	N	^	n	~	Ä	×	«	¥		Ì	—	■
F			/	?	O	_	o	▒	Å	ƒ	»		¤		´	

■ Font Sample

A/0123456789@ABCDEFGHIJKL
B/0123456789@ABCDEFG
C/0123456789@ABCDEFG
D/0123456789@ABCDEF
E/0123456789@ABCD
F/0123456789@ABCDEF
M/0123456789@ABCDEFGHIJKLM
N/0123456789@ABCDEFGHIJKLMNOPQ
O/0123456789@ABCDEFGHIJKLMNOPQ
P/0123456789@ABCDEFGHI
Q/0123456789@ABCDEFGHI
R/0123456789@ABCDEF
S/0123456789@ABCDEF
T/0123456789@ABCDEF
G/0123456789@ABCDEFGHIJKLMNOPQRST
H/0123456789@ABCDEFGHIJ
I /0123456789@ABCDEF
J /0123456789@ABCDEF
K/0123456789@ABC
L /0123456789@ABCDEF
ABC

■ Barcode Sample

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TEC

TOSHIBA TEC CORPORATION

E PRINTED IN JAPAN
EO1-33006

TEC Label Printer

B-450-HS-QQ SERIES

Owner's Manual

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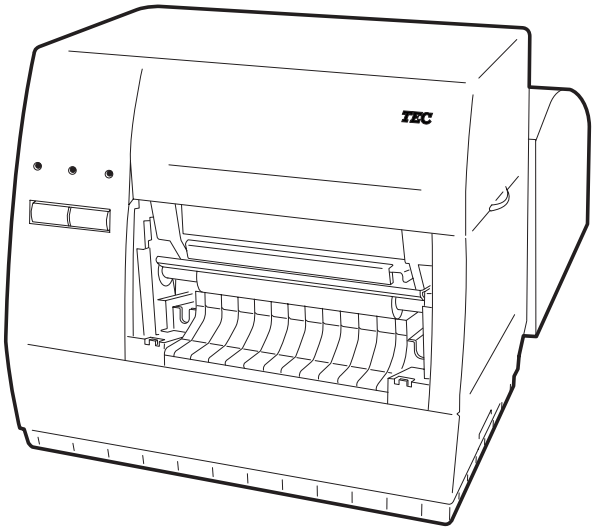

TOSHIBA TEC CORPORATION

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operations of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. (for USA only)

Changes or modifications not expressly approved by manufacturer for compliance could void the user's authority to operate the equipment.

"This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations."

"Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur de Canada."

(for CANADA only)

敬告使用者 ：
這是甲類的資訊產品,在居住的環境中使用時,可能會造成射頻
干擾,在這種情況下,使用者會被要求採取某些適當的對策.

(for QQ only)

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570 Ohito, Ohito-cho, Tagata-gun, Shizuoka-ken, JAPAN

Safety Summary

Personal safety in handling or maintaining the equipment is extremely important. Warnings and Cautions necessary for safe handling are included in this manual. All warnings and cautions contained in this manual should be read and understood before handling or maintaining the equipment.
Do not attempt to effect repairs or modifications to this equipment. If a fault occurs that cannot be rectified using the procedures described in this manual, turn off the power, unplug the machine, then contact your authorized TOSHIBA TEC representative for assistance.

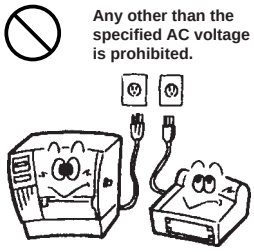
Meanings of Each Symbol

This symbol indicates warning items (including cautions).
Specific warning contents are drawn inside the △ symbol.
(The symbol on the left indicates a general caution.)

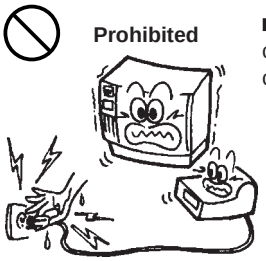
This symbol indicates prohibited actions (prohibited items).
Specific prohibited contents are drawn inside or near the ⃠ symbol.
(The symbol on the left indicates “no disassembling”.)

This symbol indicates actions which must be performed.
Specific instructions are drawn inside or near the ● symbol.
(The symbol on the left indicates “disconnect the power cord plug from the outlet”.)

WARNING This indicates that there is the risk of **death** or **serious injury** if the machines are improperly handled contrary to this indication.



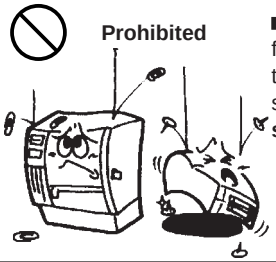
■ Do not use voltages other than the voltage (AC) specified on the rating plate, as this may cause **fire** or **electric shock**.



■ Do not plug in or unplug the power cord plug with wet hands as this may cause **electric shock**.

■ If the machines share the same outlet with any other electrical appliances which consume large amounts of power, the voltage will fluctuate widely each time these appliances operate. Be sure to provide an exclusive outlet for the machine as this may cause the machines to **malfunction**.

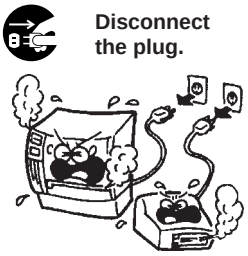
■ Do not place metal objects or water-filled containers such as flower vases, flower pots or mugs, etc. on top of the machines. If metal objects or spilled liquid enter the machines, this may cause **fire** or **electric shock**.



■ Do not insert or drop metal, flammable or other foreign objects into the machines through the ventilation slits, as this may cause **fire** or **electric shock**.

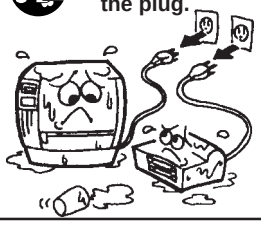
■ Do not scratch, damage or modify the power cords. Also, do not place heavy objects on, pull on, or excessively bend the cords, as this may cause **fire** or **electrical shock**.

■ If the machines are dropped or their cabinets damaged, first turn off the power switches and disconnect the power cord plugs from the outlet, and then contact your authorized TOSHIBA TEC representative for assistance. Continued use of the machine in that condition may cause **fire** or **electric shock**.



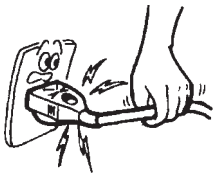
■ Continued use of the machines in an abnormal condition such as when the machines are producing smoke or strange smells may cause **fire** or **electric shock**. In these cases, immediately turn off the power switches and disconnect the power cord plugs from the outlet. Then, contact your authorized TOSHIBA TEC representative for assistance.

Disconnect the plug.



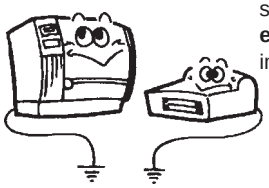
■ If foreign objects (metal fragments, water, liquids) enter the machines, first turn off the power switches and disconnect the power cord plugs from the outlet, and then contact your authorized TOSHIBA TEC representative for assistance. Continued use of the machine in that condition may cause **fire** or **electric shock.**

Disconnect the plug.



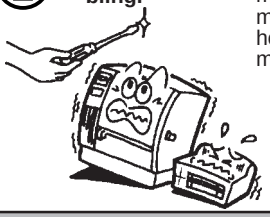
■When unplugging the power cords, be sure to hold and pull on the plug portion. Pulling on the cord portion may cut or expose the internal wires and cause **fire** or **electric shock**.

Connect a grounding wire.



■ Ensure that the equipment is properly grounded. Extension cables should also be grounded. **Fire** or **electric shock** could occur on improperly grounded equipment.

No disassembling.



■ Do not remove covers, repair or modify the machine by yourself. You may be **injured** by high voltage, very hot parts or sharp edges inside the machine.

CAUTION This indicates that there is the risk of personal **Injury** or **damage** to objects if the machines are improperly handled contrary to this indication.

Precautions

The following precautions will help to ensure that this machine will continue to function correctly.

- Try to avoid locations that have the following adverse conditions:
  * Temperatures out of the specification * Direct sunlight * High humidity
  * Shared power source * Excessive vibration * Dust/Gas
- The cover should be cleaned by wiping with a dry cloth or a cloth slightly dampened with a mild detergent solution. NEVER USE THINNER OR ANY OTHER VOLATILE SOLVENT on the plastic covers.
- USE ONLY TOSHIBA TEC SPECIFIED paper and ribbons.
- DO NOT STORE the paper or ribbons where they might be exposed to direct sunlight, high temperatures, high humidity, dust, or gas.
- Ensure the printer is operated on a level surface.
- Any data stored in the memory of the printer could be lost during a printer fault.
- Try to avoid using this equipment on the same power supply as high voltage equipment or equipment likely to cause mains interference.
- Unplug the machine whenever you are working inside it or cleaning it.
- Keep your work environment static free.
- Do not place heavy objects on top of the machines, as these items may become unbalanced and fall causing **injury**.
- Do not block the ventilation slits of the machines, as this will cause heat to build up inside the machines and may cause **fire**.
- Do not lean against the machine. It may fall on you and could cause **injury**.
- Care must be taken not to injure yourself with the printer paper cutter.
- Unplug the machine when it is not used for a long period of time.

Request Regarding Maintenance

- Utilize our maintenance services.
  After purchasing the machine, contact your authorized TOSHIBA TEC representative for assistance once a year to have the inside of the machine cleaned. Otherwise, dust will build up inside the machines and may cause a **fire** or a **malfunction**. Cleaning is particularly effective before humid rainy seasons.
- Our preventive maintenance service performs the periodic checks and other work required to maintain the quality and performance of the machines, preventing accidents beforehand.
  For details, please consult your authorized TOSHIBA TEC representative for assistance.
- Using insecticides and other chemicals
  Do not expose the machines to insecticides or other volatile solvents. This will cause the cabinet or other parts to deteriorate or cause the paint to peel.

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CAUTION:

1. *This manual may not be copied in whole or in part without prior written permission of TOSHIBA TEC.*
2. *The contents of this manual may be changed without notification.*
3. *Please refer to your local Authorized Service representative with regard to any queries you may have in this manual.*

1. INTRODUCTION

Thank you for choosing the TEC B-450 Series thermal transfer printer. This new generation high performance high quality printer is equipped with the latest hardware including the newly developed high density (23.6 dots/mm 600 dots/inch) print head. This allows very clear print at a maximum speed of 50.8 mm/sec. (2 inch/sec.). Other standard features include an external paper supply.
Optional features include a strip mechanism and cutter mechanism.
This manual contains general set-up and maintenance information and should be read carefully to help gain maximum performance and life from your printer. For most queries please refer to this manual and keep it safe for future reference.

1.1 APPLICABLE MODEL

- B-452-HS12-QQ
- B-452-HS12-QQ-US

Model name description

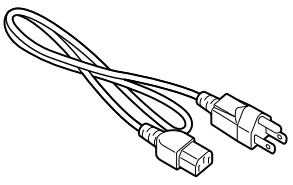
B - 4 5 2 - H S 1 2 - Q Q

- Destination Code
  QQ-US: North America Block, QQ: Except for QQ-US
- Specification
  12: with Centronics interface and expansion I/O interface
- Issue mode
  S: Batch
- Resolution
  H: 23.6 dots/mm (600 dpi)

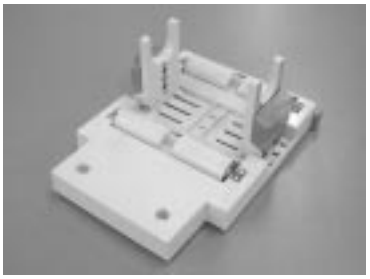
1.2 ACCESSORIES

Owner's Manual
(EO1-33019)

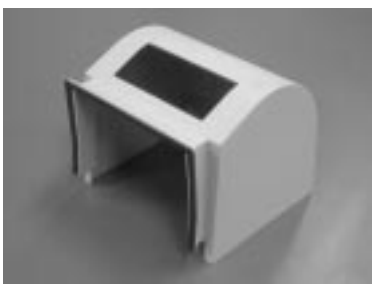
Power Cord

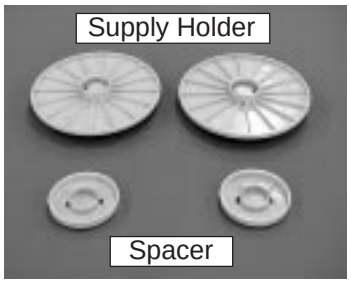


Supply Holder Unit



Supply Cover





2. SPECIFICATIONS

2.1 GENERAL SPECIFICATIONS

Item \ Model	B-452-HS12-QQ
Supply voltage	100 - 120V, 60Hz
Power consumption	1.8 A, 140 W max. (standby: 0.22 A, 13.5 W)
Operating temperature	5˚C ~ 40˚C
Relative humidity	25% ~ 85%RH (no condensation)
Dimensions	268 mm (width) x 244 mm (height) x 198 mm (depth), with Supply holder unit 410 mm (depth)
Weight	Printer: 5.0 kg (without paper and ribbon) Supply Holder + Supply Cover: 2.5 kg

2.2 PRINTING SPECIFICATIONS

Item \ Model	B-452-HS12-QQ
Print head	Thermal print head 23.6 dots per mm (600 dots per inch)
Printing method	Thermal transfer
Print speeds	50.8 mm/sec. (2 inch/sec.)
Maximum print width	103.6 mm (4.08 inches)
Dispensing modes	Batch (Continuous), Strip (Option) and Cut modes (Option) (Both cut and strip modes are available only when their respective modules are fitted.)
Available bar-code types	JAN8, JAN13, EAN8, EAN8 + 2 digits, EAN8 + 5 digits EAN13, EAN13 + 2 digits, EAN13 + 5 digits UPC-E, UPC-E + 2 digits, UPC-E + 5 digits UPC-A, UPC-A + 2 digits, UPC-A + 5 digits, UPC-B MSI, ITF, NW-7, CODE39, CODE93, CODE128, EAN128 Industrial 2 to 5, UCC/EAN128, Customer bar code, POSTNET RM4SCC, KIX code
Two-dimensional code	Data Matrix, PDF417, QR code, Maxi code
Graphics	All types of graphic files are available when using the windows driver. However, only BMP and PCX files are available when using the programming commands.
Fonts	Times Roman (6 sizes), Helvetica (6 sizes), Presentation (1 size), Letter Gothic (1 size), Prestige Elite (2 sizes), Courier (2 sizes), OCR (2 types), Writable characters, Outline font (7 type), Ture Type fonts Optional True Type Fonts (20 type)
Rotations	0˚, 90˚, 180˚, 270˚
Standard interfaces	Serial interface (RS-232C) Parallel interface (Centronics) Expansion I/O interface Keyboard interface

∗ *Data Matrix™ is a trademark of International Data Matrix, Inc.*
PDF417 is a trademark of Symbol Technologies, Inc.
QR code is a trademark of DENSO CORPORATION.
Maxi code is a trademark of United Parcel Service of America, Inc.

2.3 PAPER (LABEL) SPECIFICATIONS

[Unit: mm]

Item \ Label dispensing mode	Batch mode	Strip mode	Cut mode
Span of one label	7.0 ~ 999.0	25.4 ~ 999.0	37.0 ~ 999.0
Label length	5.0 ~ 997.0	23.4 ~ 997.0	31.0 ~ 993.0
Width including backing paper	25.4 ~ 110.0		
Label width	20.0 ~ 107.0		
Gap length	2.0 ~ 20.0	2.0 ~ 20.0	6.0 ~ 20.0
Black mark length	2.0 ~ 10.0		
Effective print width	10.0 ~ 103.6		
Effective print length	3.0 ~ 200.0	21.4 ~ 200.0	29.0 ~ 200.0
Print speed up/slow down area	1.0		
Outer roll diameter	MAX. ø152.4 (Paper Core ø38, 40, 42 or 76.2)		
Thickness (Backing paper + label)	0.1 ~ 0.17	0.13 ~ 0.17	0.1 ~ 0.17
Thickness of backing paper	0.056 ~		

2.4 RIBBON SPECIFICATIONS

Type	Spool type
Width	60 mm ~ 110 mm
Length	(270 m)
Outer diameter	Ø65 mm (max.)

NOTES: *1. To ensure good print quality and maximum print head life use only TOSHIBA TEC specified paper and ribbons.*

2. For further information about paper and ribbon, refer to Section 10. CARE/HANDLING OF THE PAPER AND RIBBON.

2.5 OPTION

Option Name	Type	Description
Cutter module	B-7204-QM	A stop-and-cut rotary cutter
Strip module	B-7904-H-QM	This module strips the label from the backing paper with the take-up block and strip block.
Keyboard module	KB-80-QM	This module is an external intelligent keyboard unit.

NOTE: *To purchase the OPTIONAL KIT, please contact your authorized TOSHIBA TEC representative or TOSHIBA TEC Head Quarter.*

3. APPEARANCE

3.1 FRONT/REAR VIEW

Front View

Rear View

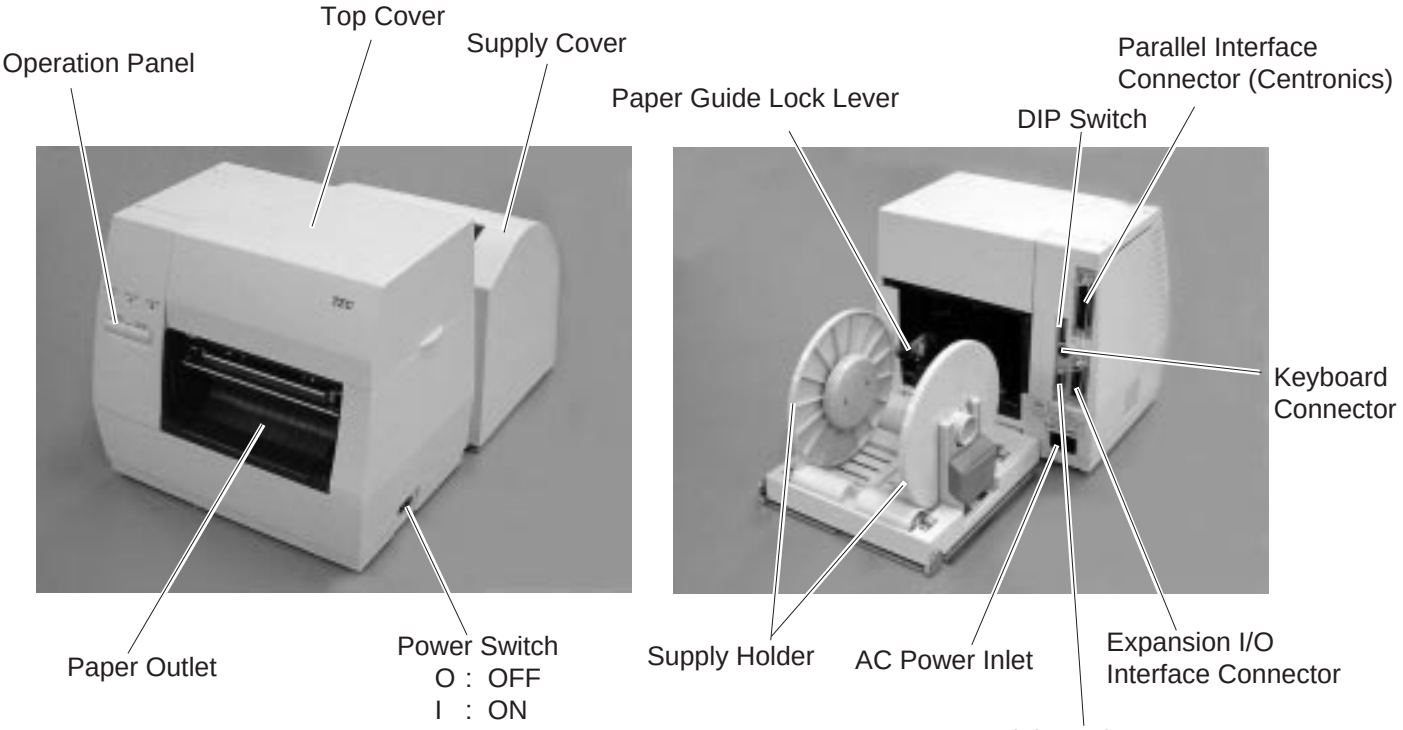


Fig. 3-1

3.2 OPERATION PANEL

Fig. 3-2

POWER LED (Green)
Lights when the power is turned on.

ON-LINE LED (Green)
1) Flashes when communicating with a host computer.
2) On while printing.

ERROR LED (Red)
Lights when a communication error occurs, when the paper/ribbon ends or the printer is not operating correctly.

FEED Key
Feeds paper.

PAUSE Key
Pauses printing.
Resets the printer when paused or when an error occurs.

4. DIP SWITCH FUNCTIONS

The DIP switches are located at the rear of the printer.

WARNING!
Turn the POWER OFF before changing the DIP switches.

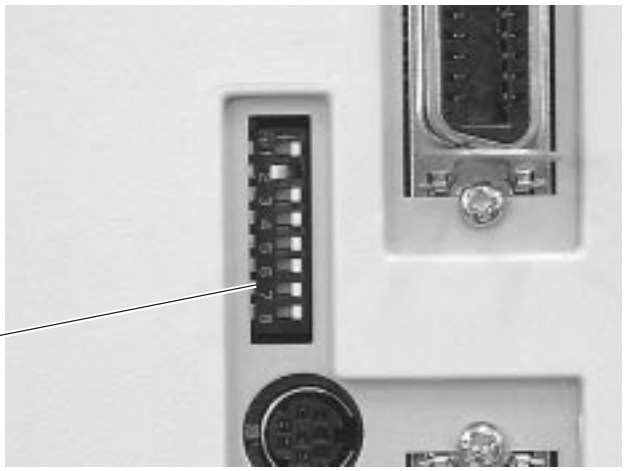


Fig. 4-1

DIP SW

No.	ON/OFF		Function	Remarks
1 2	1	2		Transmission speed (Baud rate)
	OFF	OFF	2400 bps	
	ON	OFF	4800 bps	
	OFF	ON	9600 bps	
	ON	ON	19200 bps	
3	OFF		None	Parity
	ON		EVEN	
4	OFF		Not available	Stacker
	ON		Available	
5	OFF		Available	Auto media feed
	ON		Not available	
6 7	6	7		Selectable only when DIP SW #8 is ON.
	OFF	OFF	RAM clear mode (Maintenance counter)	
	ON	OFF	Threshold manual setting mode	
	OFF	ON	Sensor adjustment mode	
	ON	ON	RAM clear mode (Parameter)	
8	OFF		Normal operation mode	Operating mode
	ON		Program down load operation	

NOTES: *1. DIP Switch settings are read at power on time.*

2. To enter the program download mode first set DIP SW #8 to ON. The printer will then enter the relevant modes, as selected by DIP SWS #6 and #7. To initialise these modes hold down the ***[FEED]*** *or* ***[FEED]*** *and* ***[PAUSE]*** *keys whilst turning the power on. If the printer is turned on without pressing a key, it will enter the program download mode. Do not set the switches to the maintenance mode as this may cause a failure.*

5. SET UP PROCEDURE

5.1 REQUIREMENTS FOR OPERATION

This machine has the following requirements:

- The host computer must have a serial port or centronics parallel port.
- To communicate with host, either an RS-232C cable or Centronics cable is required.
  (1) RS-232C cable .....9 pins
  (2) Centronics cable .....36 pins
- To print a label format, create the complete program using the interface/communication manual or use a bespoke labelling package or Windows Driver.

■ Interface Cables

To prevent radiation and reception of electrical noise, the interface cables must meet the following requirements:

- Fully shielded and fitted with metal or metalised connector housings.
- Kept as short as possible.
- Should not be bundled tightly with power cords.
- Should not be tied to power line conduits.

■ RS-232C Cable description

The serial data cable used to connect the printer to the host computer should be one of the following two types:

NOTE: *Use an RS-232C cable with imperial (inch) connector securing screws.*

DB-9S
Connector to PC

PIN No.	Signal
1	N.C.
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	N.C.
Housing	Shield

DB-9P
Connector to Printer

PIN No.	Signal
1	N.C.
2	TXD
3	RXD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS
9	N.C.
Housing	Shield

DB-25S
Connector to PC

PIN No.	Signal
1	Shield
2	TXD
3	RXD
4	RTS
5	CTS
6	DSR
7	GND
20	DTR

DB-9P
Connector to Printer

PIN No.	Signal
1	N.C.
2	TXD
3	RXD
4	DSR
5	GND
6	DTR
7	CTS
8	RTS
9	N.C.

Fig. 5-1

5.2 SETTING UP THE PRINTER

- Place the printer on a flat, stable surface.
- Use a grounded electrical outlet do not use adapter plug.
- Be sure there is adequate room around the printer for easy operation and maintenance.
- Keep your work environment static free.

6. INSTALLATION PROCEDURE

6.1 INSTALLING THE SUPPLY HOLDER UNIT

WARNING!
Turn the power OFF before installing the supply holder unit.

Fit the two studs on the bottom of the printer into the holes in the supply holder unit.

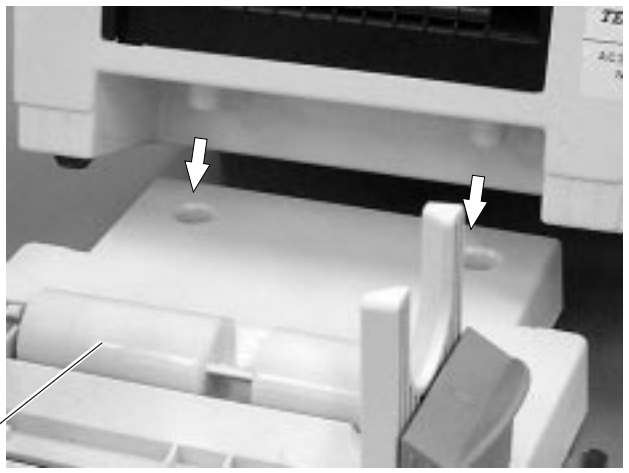


Fig. 6-1

6.2 INSTALLING THE SUPPLY COVER

Fit both hooks of the supply cover onto the shafts of the supply holder, and then gently close the supply cover. (Refer to Fig. 6-2)

NOTE: *After this section, the supply cover will be removed in photos and figures. Please understand that it provides clearer descriptions.*

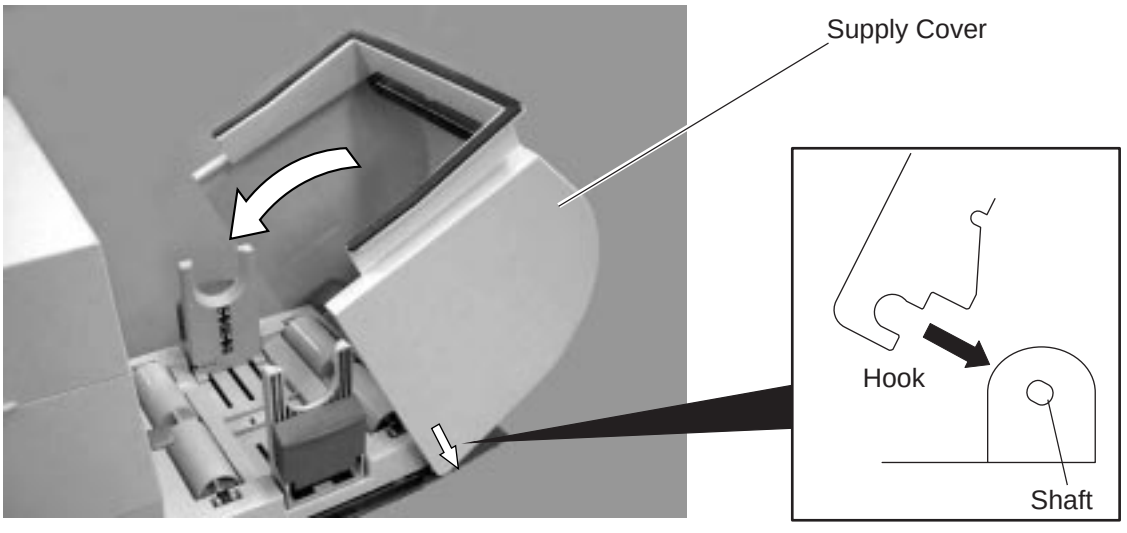


Fig. 6-2

6.3 CONNECTING THE POWER CORD AND CABLES

WARNING!
*Turn the **POWER SWITCH to OFF** before connecting the power cord or cables.*

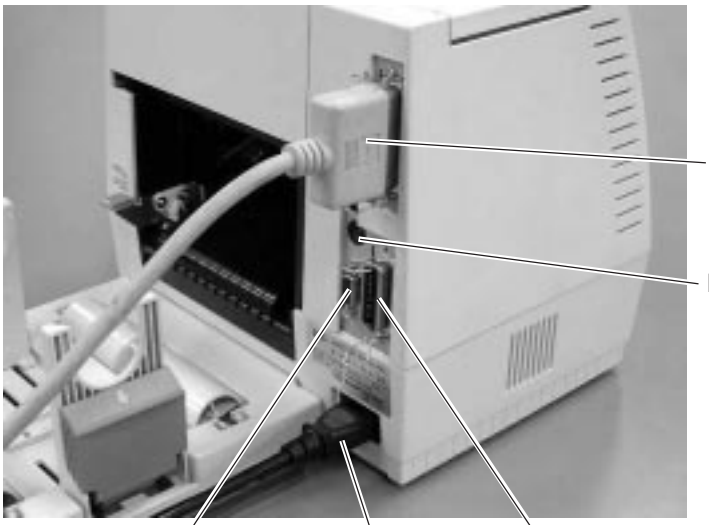


Fig. 6-3

7. LOADING THE RIBBON

WARNING!
Be careful when handling the print head as it becomes very hot.

The printer is capable of printing in thermal transfer mode only.

1. Turn the power off and open the top cover.
2. Move the head release lever toward the front of the printer and raise the print head block.

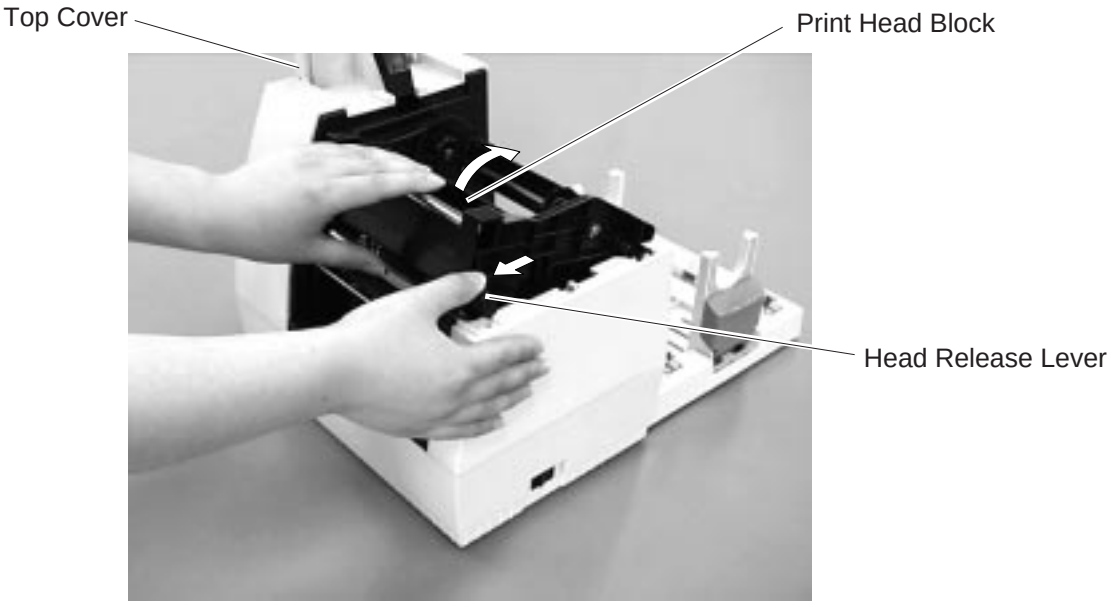


Fig. 7-1

3. Fit the protrusion of the guide wheel into the notch of the ribbon core (take-up side).
4. Pull the knob and set the ribbon core to the spring guide wheel.

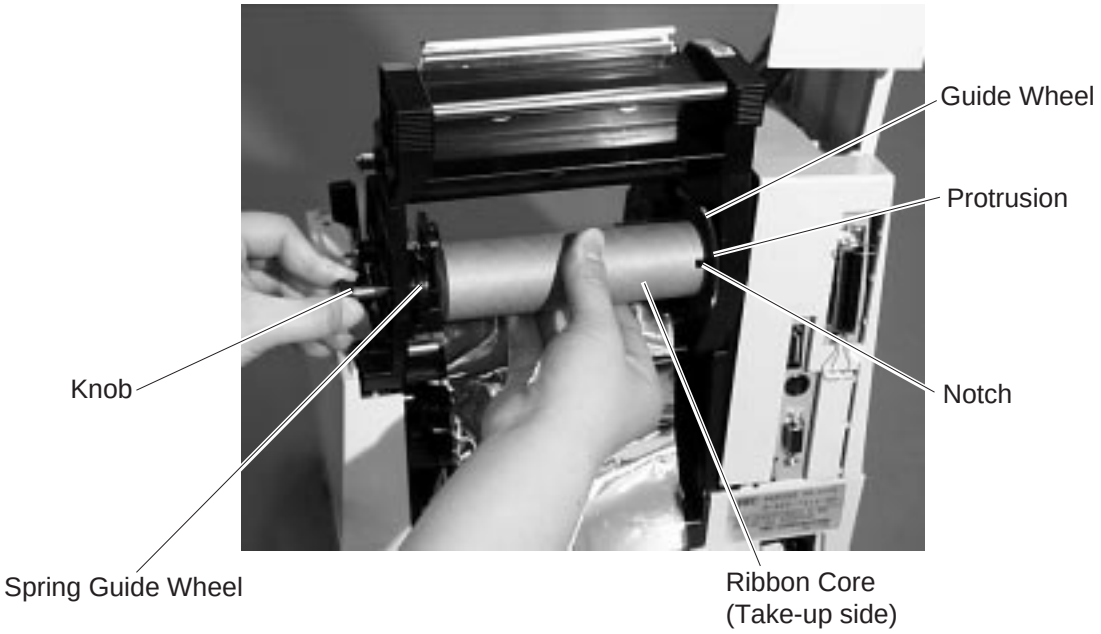


Fig. 7-2

5. Set the ribbon core (supply side) by fitting the protrusion into the notch.

Fig. 7-3

6. Turn the guide wheel in the direction indicated by the arrow to remove any slack on the ribbon.

NOTE: *Make sure that the ribbon has no wrinkles and the protrusions are fitted into the notches of the ribbon cores.*

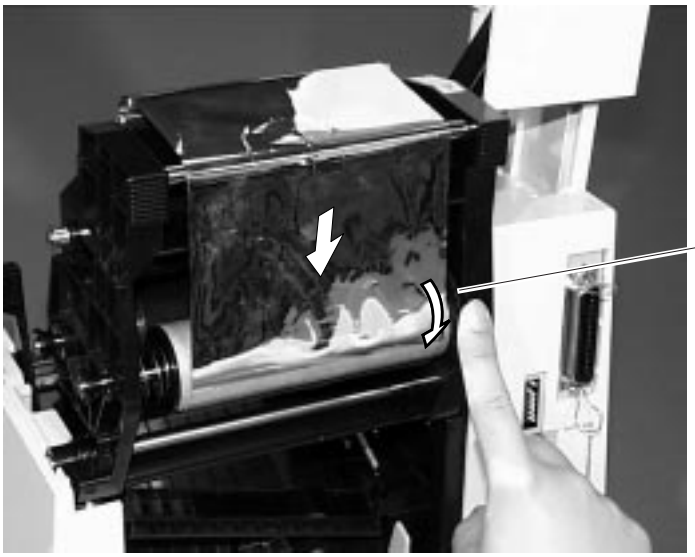


Fig. 7-4

8. LOADING THE PAPER

WARNING!

Be careful when handling the print head as it becomes very hot.

This supply holder accepts four sizes of label core: 38 mm, 40 mm, 42 mm and 76.2 mm.
When using a paper roll of 38 mm, 40 mm or 42 mm, remove the spacers from the supply holders using the following procedure.

1. Remove the supply cover.
2. Push both hooks of the spacer to remove it from the supply holder. Keep the removed spacers safe.

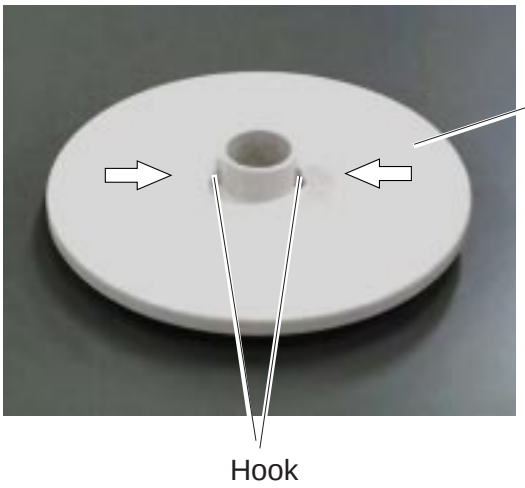


Fig. 8-1

Fig. 8-2

3. Set the supply holders to both sides of the paper roll.

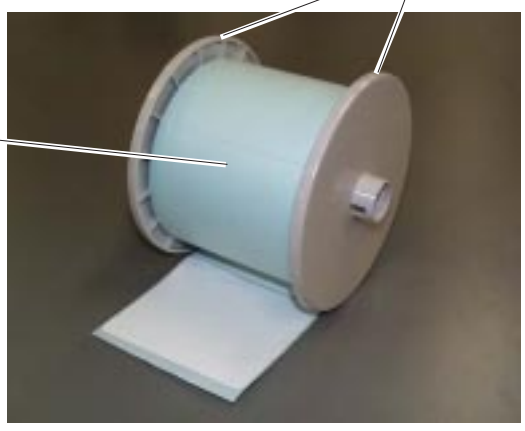


Fig. 8-3

4. Put the paper roll and supply holders on the supply holder unit.

NOTE: *The paper must be loaded so that the print side faces upward.*

Fig. 8-4

5. Push both sides of the supply holder guides against the paper roll, then lock them with the lock lever.

NOTE: *Make sure that the supply holders rotate slightly.*

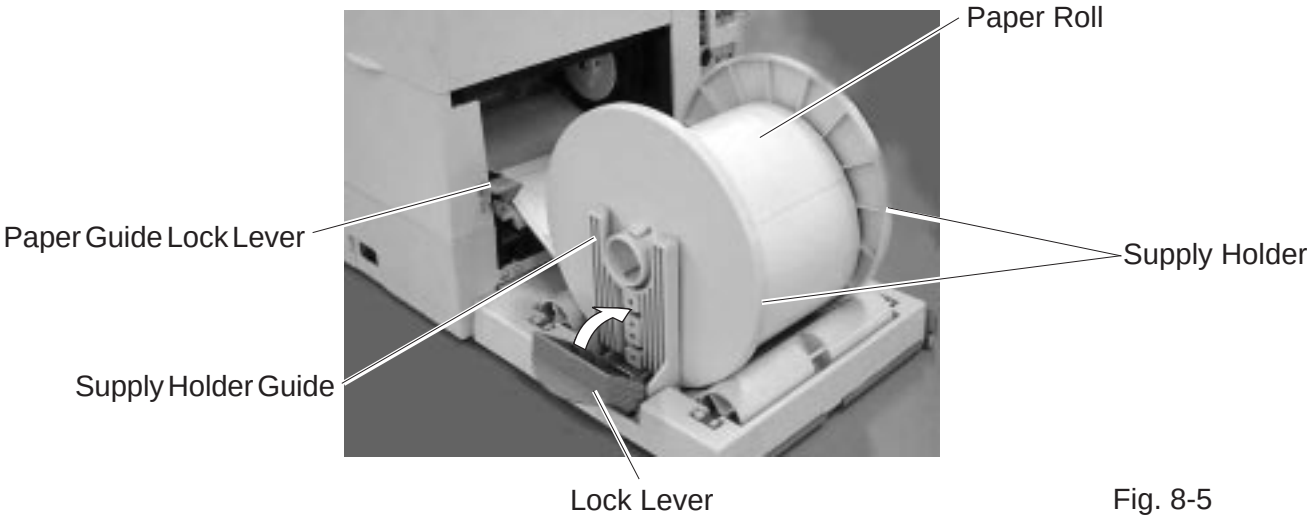


Fig. 8-5

6. Lift up the paper guide lock lever to release the paper guides.
7. Draw the label towards the paper guides.
8. Release the lock lever in the direction indicated by the arrow, and gently lift the sensor cover.

NOTE: *Lift the sensor cover gently so that it does not touch the ribbon.*

9. Adjust the position of the paper guides to the label width, and return the paper guide lock lever to lock the paper guide.

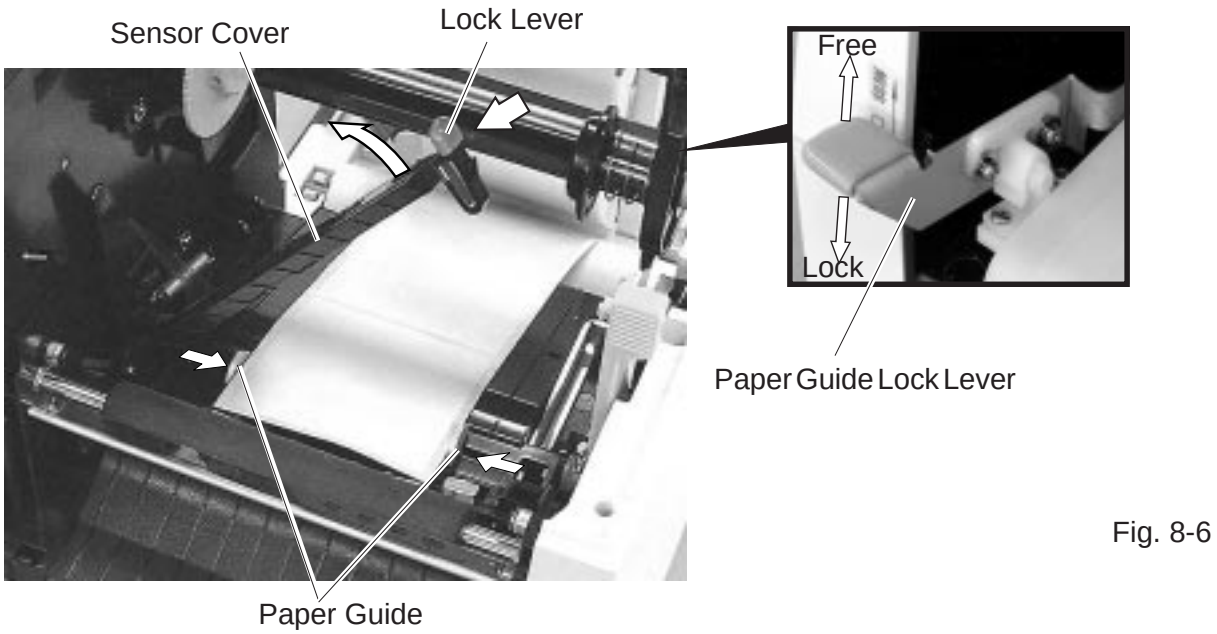


Fig. 8-6

10. For details on changing the black mark sensor position according to the black mark position, refer to the Section “Setting the black mark sensor position”. When using the round or pre-printed label, refer to the Section “Setting the feed gap sensor position” and adjust the sensor position.
11. Draw the label onto the platen. Close the sensor cover and return the lock lever to lock the sensor cover tight.
12. Close the print head block by pressing both sides of the print head block’s top until it clicks.

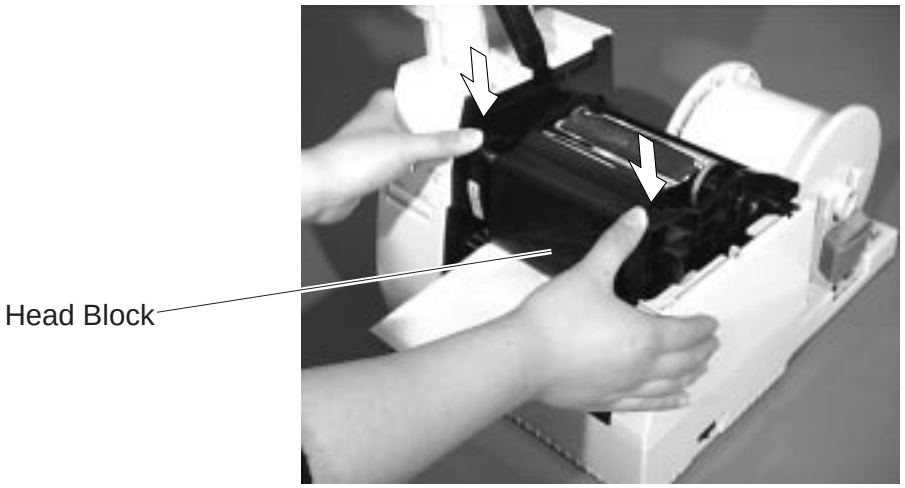


Fig. 8-7

NOTE: *Pass the paper straight from the supply holder to paper outlet. Failure to do this may cause skew feeding or paper jam.*

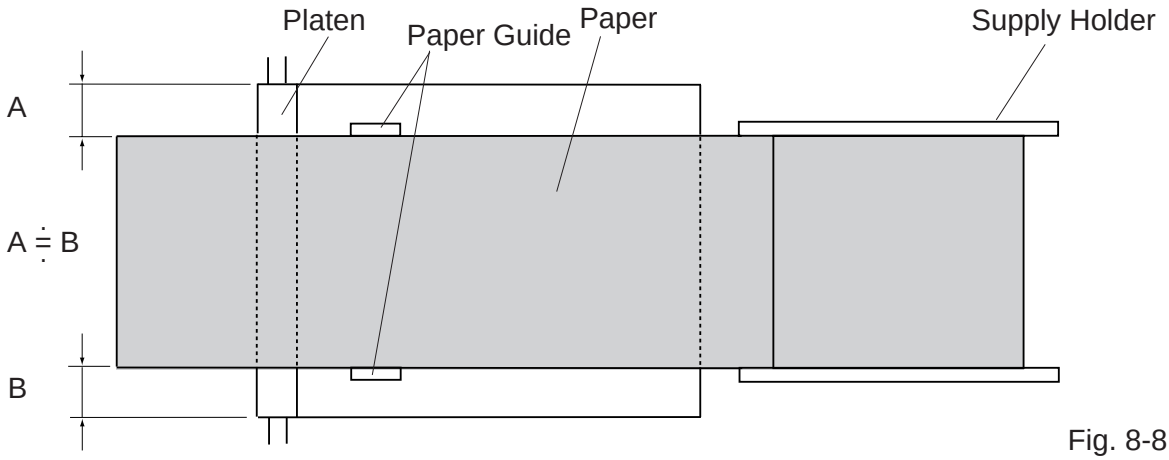


Fig. 8-8

13. Close the top cover, and then attach the supply cover to the supply holder unit. (Refer to section 6.2 INSTALLING THE SUPPLY COVER.) Paper loading is now complete.

Batch type:

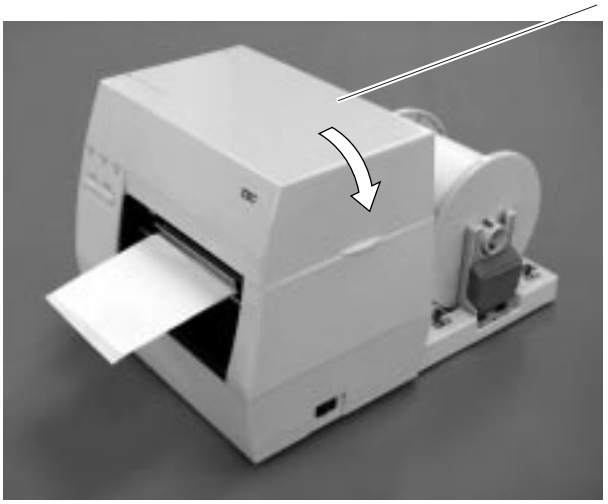


Fig. 8-9

Cutter type: Where a cutter is fitted load the paper as standard and feed it through the cutter module.

NOTE: *When using the cutter, be sure to cut the backing paper between the labels. Cutting on the label will cause the glue to stick to the cutter, which may affect the cutter quality and shorten it's life.*

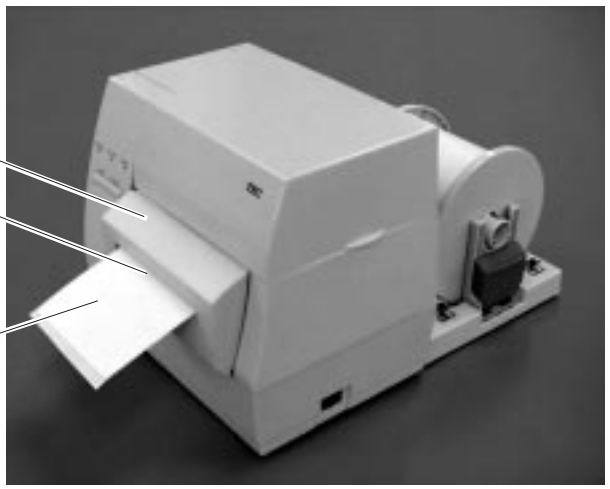


Fig. 8-10

Strip type:

① Strip the labels from the backing paper for about 200-mm from the top edge of the label roll.

② First push the strip lever toward the printer to release the hook, and then pull the strip lever.

③ Pass the backing paper between the strip roller and the strip guide roller. After taking up any slack on the paper, set the strip lever in position.

Fig. 8-11

■ Setting the black mark sensor position

① Fold over the end of the label. Then, move sensor knob A in a the horizontal direction so that the ⊣⊢ mark on the sensor cover aligns with the black mark. Remember the number that centre of the sensor knob A is positioned at. Set the sensor knob B to the same position number.

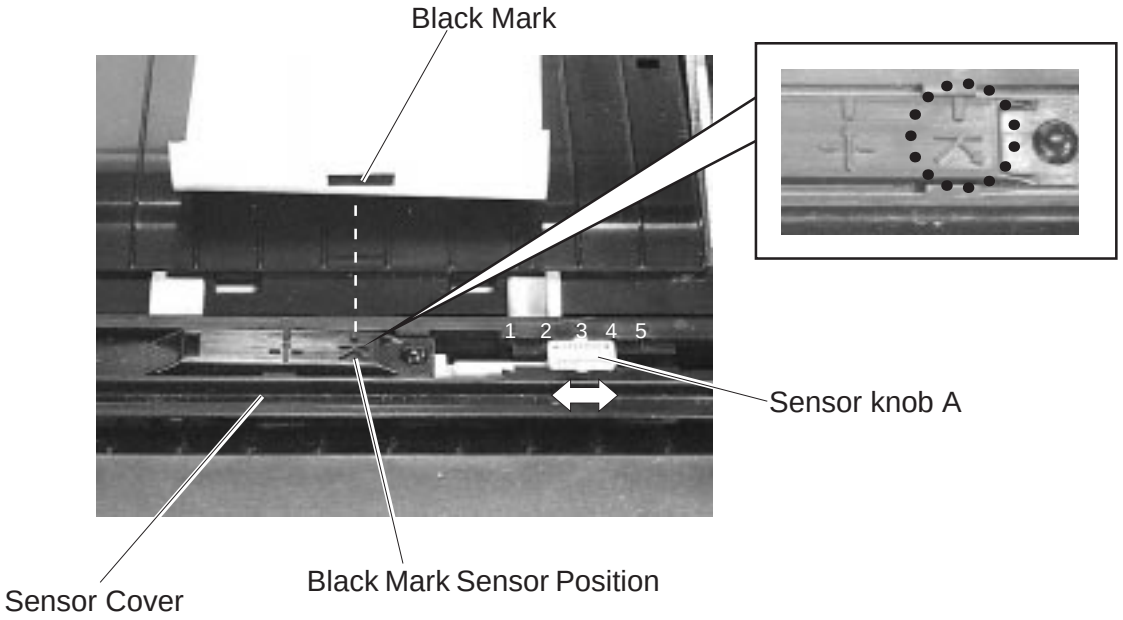


Fig. 8-12

② Release the lock lever in the direction indicated by the arrow, and gently lift the sensor cover.
NOTE: *Lift the sensor cover gently so that it does not touch the ribbon.*

③ Set sensor knob B to the same position number as the sensor knob A.
NOTE: *The sensor knobs A and B are set to the position #3 where the black mark is centred in the label width as a default. Do not change the position of sensor knobs A and B except when changing the sensor detecting position. Be sure to set sensor knobs A and B to the same position #. Failure to do this may cause a paper feed error and paper end detecting error.*

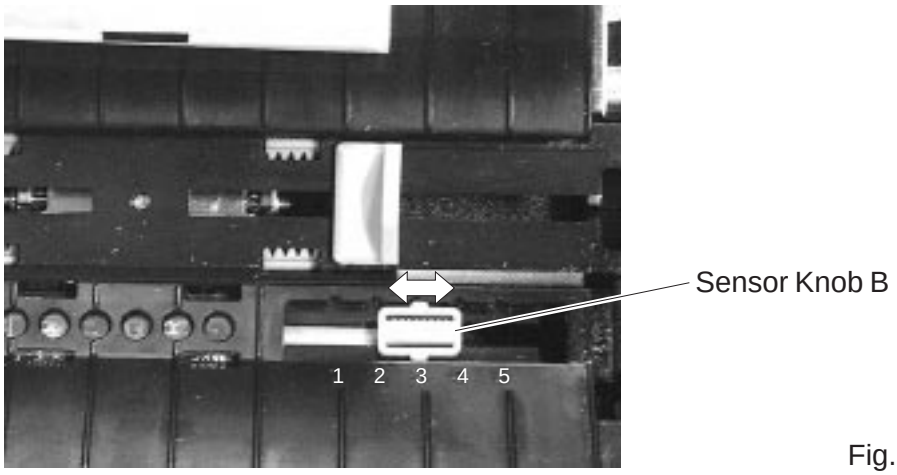


Fig. 8-13

④ Draw the label onto the platen. Close the sensor cover and return the lock lever to lock the sensor cover tight.

■ Setting the feed gap sensor position

① Move sensor knob A in a horizontal direction so that the ⊣⊢ mark on the sensor cover aligns with the centre of the label gap. Remember the number that the centre of the sensor knob A is positioned at. Set sensor knob B to the same position number.

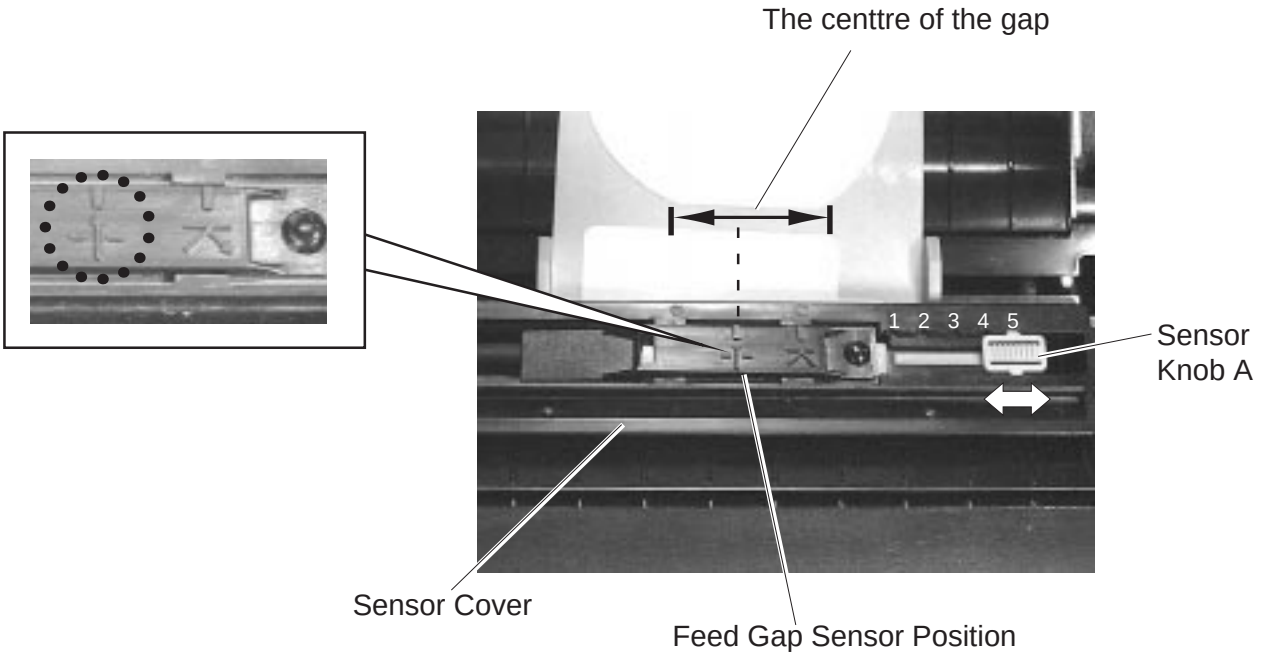


Fig. 8-14

② Release the lock lever in the direction indicated by the arrow, and gently lift the sensor cover.

NOTE: *Lift the sensor cover gently so that it does not touch the ribbon.*

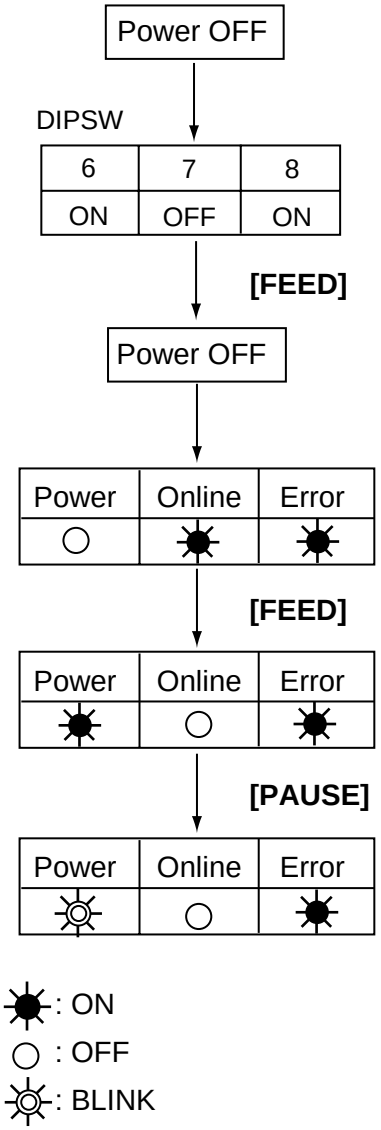
③ Set the sensor knob B to the same position # of the sensor knob A.

NOTE: *Sensor knobs A and B are set to position #3 where the black mark is centred on the label width as a default. Do not change the position of sensor knobs A and B except when changing the sensor detecting position. Be sure to set the sensor knobs A and B to the same position #. Failure to do this may cause a paper feed error and paper end detecting error.*

④ Draw the label onto the platen. Close the sensor cover and return the lock lever to lock the sensor cover tight.

9. THRESHOLD SETTING

For the printer to maintain a constant print position it uses the transmissive sensor to measure the amount of light passing through the gap between labels. When the paper is pre-printed, the darker (or more dense) inks can interfere with this process causing paper jam errors. To eliminate this problem a minimum threshold can be set for the sensor in the following way.



(1) The power is off.

(2) Set the DIP switches to enter the manual threshold setting mode.

(3) Turn the power ON while pressing and holding the **[FEED]** key.

The transmissive sensor is selected.

(4) Press the **[FEED]** key.

The reflective sensor is selected.
The sensor type is switched by pressing the **[FEED]** key. Load the pre-printed label roll in the usual way.

(5) Press and hold the **[PAUSE]** key.
The paper will feed through the printer until the **[PAUSE]** key is released. Release the **[PAUSE]** key after more than 1.5 labels have been fed.
(Threshold setting is completed by this operation.)

(6) Turn the power OFF.

NOTES: *1. To set the threshold properly, be sure to feed more than 1.5 labels. Insufficient paper feeding may result in an incorrect threshold setting. In this case, repeat the procedure.*
*2. While the print head is raised, the **[PAUSE]** key does not work.*
3. If the paper runs out or a cutter error occurs, it will not be detected during the paper feed.
4. If the printer does not print in the correct position even after the threshold setting, the transmissive sensor adjustment may be wrong. In this case, re-adjust the transmissive sensor, and then set the threshold again. (When the backing paper is thick, the transmissive sensor adjustment is required.)

10. CARE/HANDLING OF THE PAPER AND RIBBON

CAUTION:

Be sure to read carefully and understand the Supply Manual. Ask your nearest authorized TOSHIBA TEC representative for the Supply Manual. Use only paper and ribbon which meet specified requirements. Use of non-specified paper and ribbon may shorten the head life and result in problems with bar code readability or print quality. All paper and ribbon should be handled with care to avoid any damage to the paper, ribbon or printer. Read the following guideline carefully.

- Do not store the paper and ribbon for longer than the manufactures recommended shelf life.
- Store paper rolls on the flat end, do not store them on the curved sides as this might flatten that side causing erratic media advance and poor print quality.
- Store the paper in plastic bags and always reseal after opening. Unprotected paper can get dirty and the extra abrasion from the dust and dirt particles will shorten the print head life.
- Store the paper and ribbon in a cool, dry place. Avoid areas where they would be exposed to direct sunlight, high temperature, high humidity, dust or gas.
- The thermal paper used for direct thermal printing must not have specifications that exceed Na^+ 800 ppm, K^+ 250 ppm and CL^- 500 ppm.
- Some ink used on pre-printed labels may contain ingredients which shorten the print head's product life. Do not use labels pre-printed with ink which contain hard substances such as carbonic calcium ($CaCO_3$) and kaolin (Al_2O_3, $2SiO_2$, $2H_2O$).

For further information please contact your local distributor or your paper and ribbon manufacturer.

11. GENERAL MAINTENANCE

WARNING!

Be careful when handling the print head as it becomes very hot.

11.1 CLEANING

WARNING!

1. *Be sure to disconnect the power cord prior to performing any maintenance.*
2. *DO NOT POUR WATER directly onto the printer.*

CAUTION:

1. *Do not use any sharp objects to clean the print head and platen. Doing so may damage them, causing poor print quality or missing dots.*
2. *Never use organic solvents like thinners or venzene for cleaning. Using such solvents may discolour the covers, cause poor print quality, or printer failure.*
3. *Do not touch the print head element as static build-up may damage the print head.*

To help retain the high quality and performance of your printer it should be regularly cleaned. The greater the usage of the printer, the more frequent the cleaning. (i.e. low usage=weekly : high usage=daily).

1. Turn the power off.
2. Open the top cover.
3. Turn the head lever to raise the print head.
4. Remove the ribbon and paper.
5. Clean the print head element with print head cleaner

   NOTE: *Please purchase the print head cleaner from the authorized TOSHIBA TEC service representative.*

Fig. 11-1

6. Clean the platen with a cloth moistened with alcohol.
7. With a soft cloth, remove any dust or glue from the detection area of the sensors and paper path.

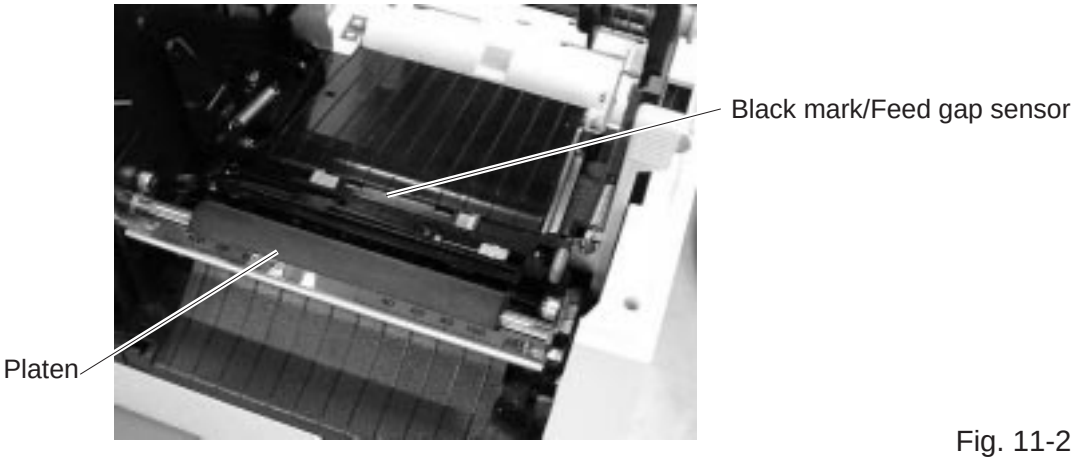


Fig. 11-2

8. Remove the supply holder rollers from the supply holder unit. Remove any dust from the recessed portions of the base and wipe glue from the rollers with a slightly moistened soft cloth.

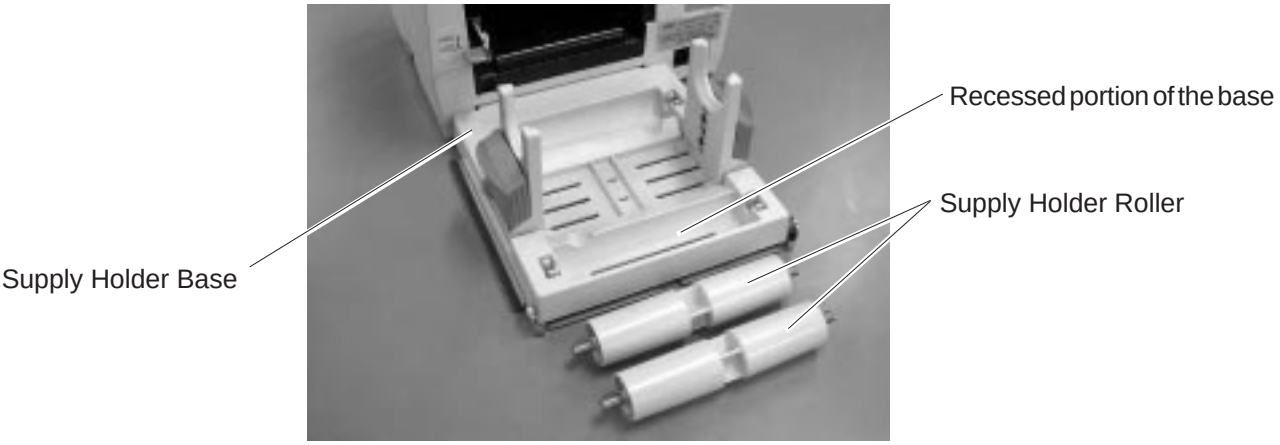


Fig. 11-3

11.2 COVERS

The covers should be cleaned by wiping with a dry cloth or a cloth slightly dampened with a mild detergent solution.

NOTE: *Clean printer cover with an electrostatic free cleaner for automated office equipment.*

WARNING!
1. DO NOT POUR WATER directly onto the printer. *2. DO NOT APPLY cleaner or detergent directly onto any cover.* *3. NEVER USE THINNER OR OTHER VOLATILE SOLVENT on the plastic covers.* *4. DO NOT clean the covers with alcohol as it may cause them to discolour, loose their shape or develop structural weakness.*

11.3 REMOVING JAMMED PAPER

1. Turn the power off.
2. Open the top cover.
3. Move the head release lever toward the front of the printer to raise the print head block.
4. Remove the ribbon and paper.
5. Release the lock lever in the direction indicated by the arrow, and gently lift the sensor cover.
6. Remove the jammed paper. DO NOT USE any sharp implement or tool as these could damage the printer.
7. Clean the print head and platen, then remove any further dust or foreign substances.

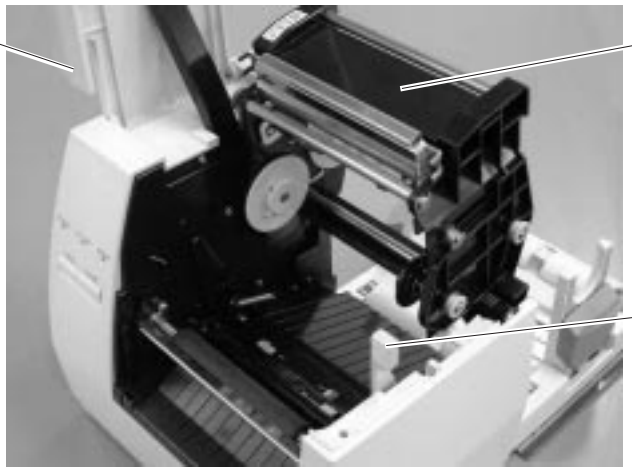


Fig. 11-4

8. Paper jams in the cutter unit can be caused by wear or residual glue from label stock on the cutter. Do not use unspecified paper in the cutter. If frequent jams occur in the cutter contact your Authorized Service representative.

■ Cleaning the Cutter Unit

WARNING!
1. Be sure to disconnect the power cord before cleaning the cutter unit. *2. The cutters are sharp and care should be taken not to injure yourself when cleaning.*

1. Press the cutter cover release lever to detach the cutter cover.

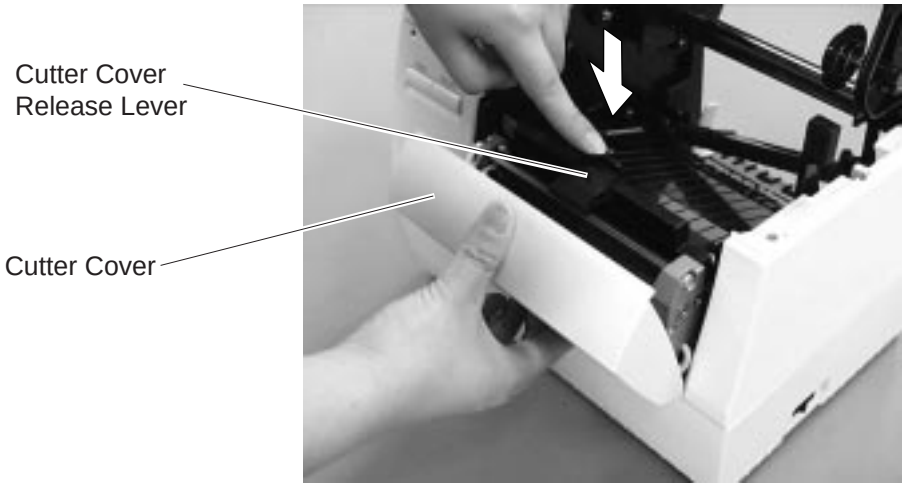


Fig. 11-5

2. Fit the enclosed Allen Key into the right side of the cutter unit to rotate the cutter manually. Remove the jammed paper and any paper particles from the cutter.
3. Clean the cutter with dry cloth.

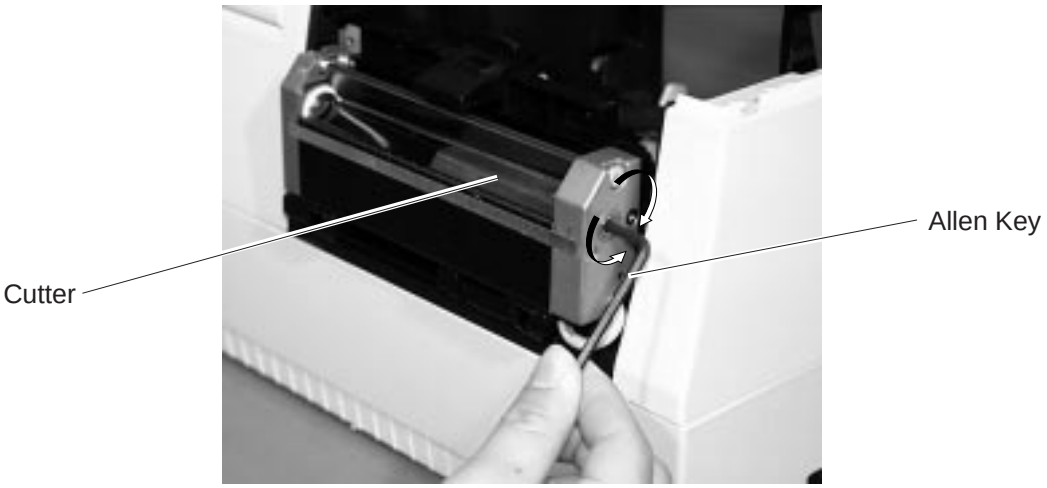


Fig. 11-6

4. Assemble in the reverse order of removal.

■ Cleaning the Strip Unit

WARNING!

1. Be sure to disconnect the power cord before cleaning the strip unit.
2. Do not touch the moving parts. To reduce the risk that fingers, jewellery, clothing, etc., be drawn into the moving parts, push the switch in the "OFF" position to stop movement.

1. First push the strip lever toward the printer to release the hook, and then pull the strip lever.
2. Remove the jammed paper, if any.
3. Clean the strip guide rollers A and B with a cloth moistened with alcohol.

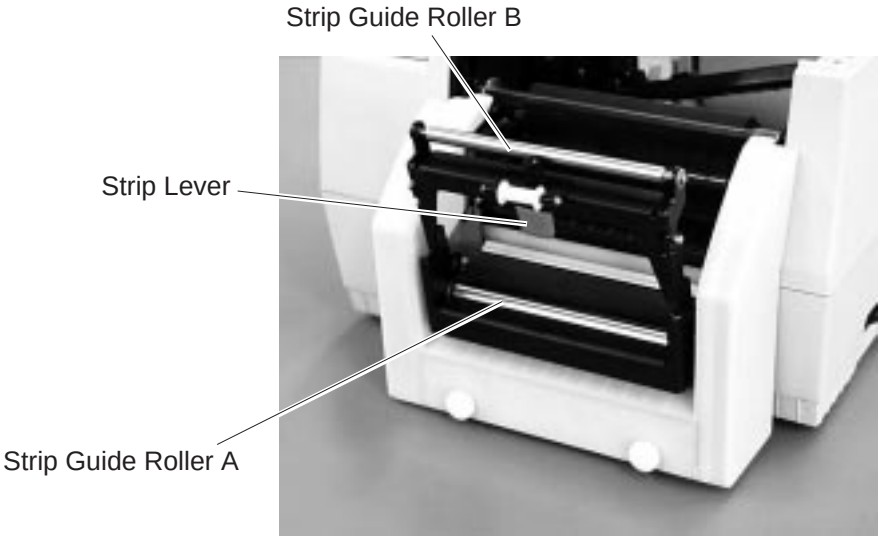


Fig. 11-7

12. TROUBLESHOOTING

WARNING!

If you cannot solve a problem with the following solutions, do not attempt to repair it yourself. Turn the power off, unplug the printer, then contact your TOSHIBA TEC representative for assistance.

If the error lamp lights during printing, refer to the following troubleshooting to solve the problem.

Error type	Problem	Solution
PAPER JAM	1. The paper is not fitted correctly.	1. Reload the paper correctly. → Press the **[PAUSE]** key.
	2. The paper path is jammed and does not feed smoothly.	2. Remove the cause of the jam and replace the paper correctly. → Press the **[PAUSE]** key.
	3. The installed paper type does not match the selected sensor.	3. Turn the power off then on again. Select the correct sensor. → Feed the paper.
	4. The installed paper size is different from the programmed size. 5. The feed gap sensor cannot see the difference between the print area and the gap.	4. Turn the power off then on again. Set the correct paper size. → Feed the paper. 5. Set the threshold (see page 9-1). Else Turn the power off and call your Authorized Service representative.
HEAD OPEN	Feeding or printing has been attempted while the print head is raised.	Lower the print head block. → Press the **[PAUSE]** key.
NO PAPER	The paper has run out.	Load new paper. → Press the **[PAUSE]** key.
EXCESS HEAD TEMP.	The print head is too hot.	Turn the power off and decrease the print head temperature.
RIBBON ERROR	1. The ribbon has run out. 2. There is a fault with the ribbon sensor.	1. Load a new ribbon. → Press the **[PAUSE]** key. 2. Turn the power off and contact your Authorized Service representative.

Error type	Problem	Solution
HEAD ERROR	This message is displayed when sending the head broken check command (**[ESC] HD001 [LF] [NUL]**) and the print head has a broken element.	1. Restart the printing by pressing the **[PAUSE]** key. 2. Replace the print head.
CUTTER ERROR	Paper is jammed in the cutter.	Remove the jammed paper and feed the undamaged media through the cutter (See page 11-3). → Press the **[PAUSE**] key. Else Turn the power off and contact your Authorized Service representative.
Other Error	Hardware or software trouble.	Turn the power off then on again. If the problem still exists turn the power off and contact your Authorized Service representative.
NOTE: *If an error cannot be cleared by pressing the **[PAUSE]** key, the power must be switched off then on again.* *Once the power has been switched off and on, all the print data in the printer is cleared.*		

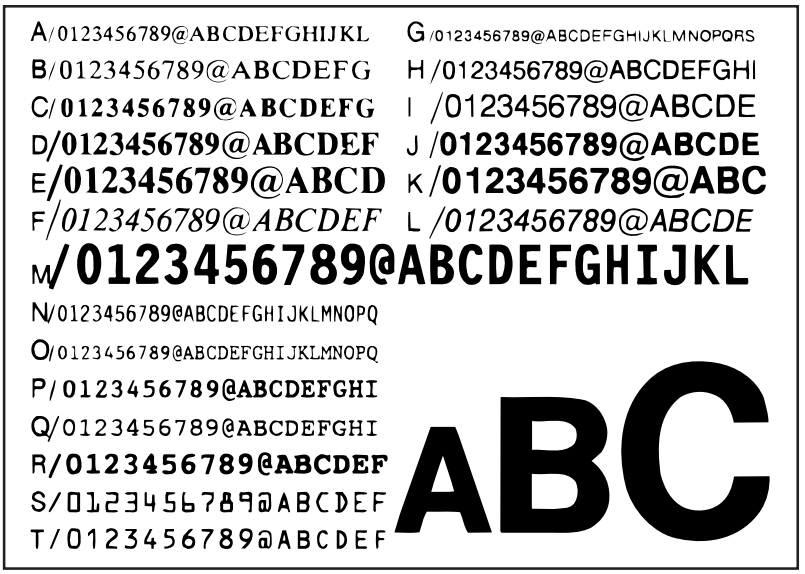
Problem	Solution
No print.	1. Check that the paper and ribbon are loaded correctly. 2. Check that print head is set correctly. 3. Check the cabling between the printer and the host.
Dots missing in the print.	Dirty print head. → Clean the print head. Call your Authorized Service representative if necessary.
Unclear (or blurred) printing.	1. Dirty print head. → Clean the print head. 2. Bad or faulty ribbon. → Replace ribbon. 3. Poor paper quality. → Change paper type.
Power does not come on.	1. Plug the power cord into an AC socket. 2. Check the circuit breakers or fuses. 3. Plug another appliance into the AC socket to check if there is power supplied. Call your Authorized Service representative if necessary.
Printer does not cut.	Check for a paper jam in the cutter. Call your Authorized Service representative if necessary.
You see a raised nap where the paper has been cut.	1. Clean the cutter blades. 2. The blades are worn. → Call your Authorized Service representative.

APPENDIX

■ ASCII Code Chart

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	€		ð	Ó	—
1			!	1	A	Q	a	q	ü	æ	í	€		Ð	ß	±
2			"	2	B	R	b	r	é	Æ	ó			Ê	Ô	=
3			#	3	C	S	c	s	â	ô	ú			Ë	Ò	¾
4			$	4	D	T	d	t	ä	ö	ñ			È	õ	¶
5			%	5	E	U	e	u	à	ò	Ñ	Á		ı	Õ	§
6			&	6	F	V	f	v	å	û	✦	Â	ã	Í	µ	÷
7			'	7	G	W	g	w	ç	ù	◷	À	Ã	Î	þ	¸
8			(	8	H	X	h	x	ê	ÿ	¿	©		Ï	Þ	°
9			)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A			*	:	J	Z	j	z	è	Ü	¬				Û	·
B			+	;	K	[	k	{	ï	ø	½				Ù	¹
C			,	<	L	\	l	|	î	£	¼				ý	³
D			–	=	M	]	m	}	ì	Ø	¡	¢		¦	Ý	²
E			.	>	N	^	n	~	Ä	×	«	¥		Ì	—	■
F			/	?	O	_	o	▒	Å	ƒ	»		¤		´	

■ Font Sample



■ Barcode Sample

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TEC

TOSHIBA TEC CORPORATION

E PRINTED IN JAPAN
EO1-33019

TEC Thermal Printer

B-450 SERIES

Product Description

Document No. **EO10-33003A**

Original **Dec., 1998**

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TOSHIBA TEC CORPORATION

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1. OUTLINE OF THE SYSTEM

1.1 FEATURES OF THE B-450 SERIES

1) Various bar codes, characters and graphic data can be printed using either thermal transfer or thermal direct methods. (HS model supports the thermal transfer method only.)
   This printer can also print writable characters and logos at designated coordinates by using a graphic command.
   It not only includes a variety of bar codes, characters and graphic data, but also comes with the new genaration data code symbol and two-dimensional codes (Data Matrix, PDF417, Maxicode, QR Code and Micro PDF) which are replacing bar codes.
2) Since the B-450 accommodates several interfaces such as the RS-232C, Centronics (QP only) and External I/O, it is very versatile.
3) A 16-bit CPU and a Gate Arrey equipped with several peripheral LSIs realizes high system performance.
4) A high dot density of 11.8 dots/mm (300 dpi) (TS model) or 23.6 dots/mm (600 dpi) (HS model) produces a clear print and the head history control system optimizes applied pulse signal to the head.
5) The TS model can print data with the size of up to 114.0 mm (W) by 999.0 mm (H) at the maximum print speed of 101.6 mm/sec. The HS model prints data with the size of up to 110.0 mm (W) by 999.0 mm (H) at the maximum speed of 50.8 mm/sec.
6) No adjustment of paper thickness or printing pressure is necessary.
7) Optional devices such as a cutter module, strip module and keyboard module are available.

***NOTE**: Every size is written in millimeter (mm) in this manual. To obtain the size in inch, divide by 25.4*

Data Matrix is a trade mark of International Data Matrix, Inc.
PDF417 is a trade mark of Symbol technologies, Inc.
QR Code is a trade mark of DENSO CORPORATION.
Maxi Code is a trade mark of united Parcel Service of America, Inc.

1.2 DESCRIPTION OF MODEL NUMBER

B - 4 5 2 - T S 1 0 - Q Q - P A C

- Special Code
  - US: North America Block
  - PAC: with a start up kit
  - No description: without a start up kit
- Destination Code
  - QP: European Version
  - QQ: Canada, Mexico, etc.
  - US: North America Block
- Specification
  - 10: without Centronics interface
  - 11,12: with Centronics interface
- Issue mode
  - S: Batch
- Resolution
  - T: 11.8 dots/mm (300 dpi)
  - H: 23.6 dots/mm (600 dpi)

1.3 APPEARANCE AND DIMENSIONS (APPROXIMATE)

1.3.1 Front View/Rear View

[TS model]

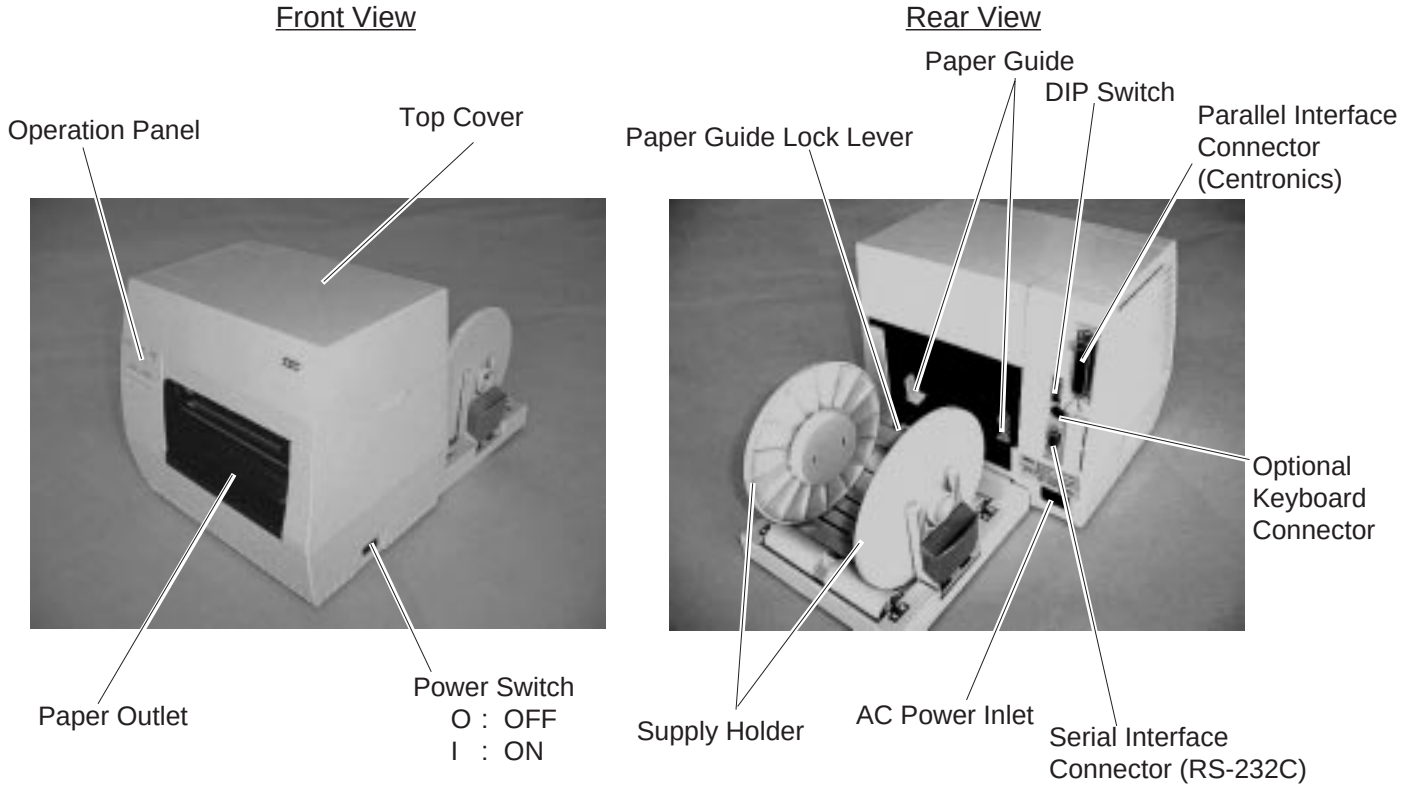


Fig. 1-1

[HS model]

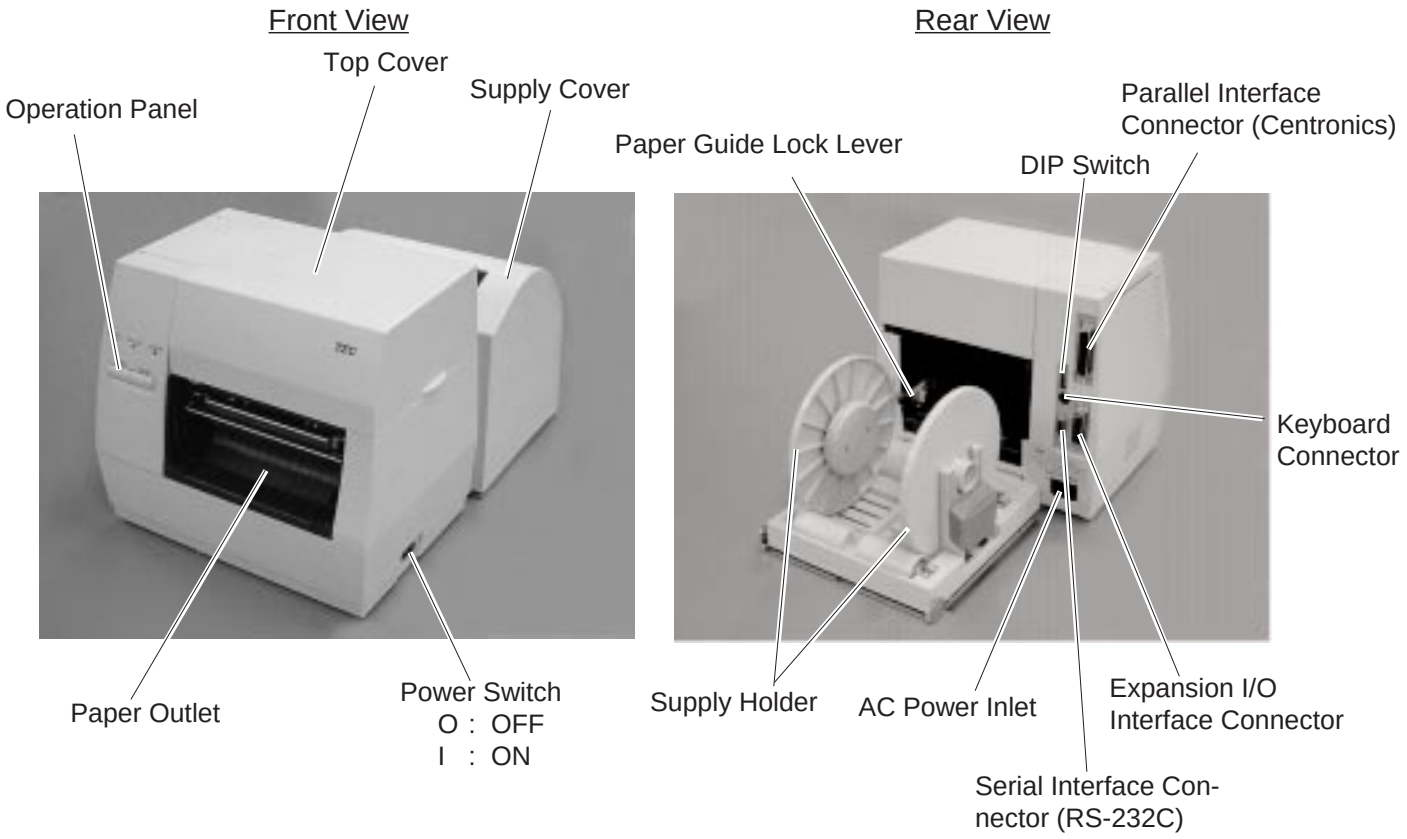


Fig. 1-2

1.3.2 Operation Panel

Fig. 1-3

POWER LED (Green)

Lights when the power is turned on.

ON-LINE LED (Green)

1) Flashes when communicating with a host computer.

2) On while printing.

ERROR LED (Red)

Lights when the printer does not operate correctly.

FEED Button

Feeds paper. Used to select options in the Diag. Test Operation mode and used to fine adjust values in the nagative direction.(Refer to the Maintenance Manual.)

PAUSE Button

Pauses printing.

Resets the printer when paused or when an error occurs.
Used to set the threshold. (Refer to Owner's Manual)
Used as an enter key in the Diag. Test Operation mode.

1.3.3 Dimension (Approximate)

Standard	:	268 mm (W) x 198 mm (D) x 244 mm (H)
With supply holder unit	:	268 mm (W) x 410 mm (D) x 244 mm (H)

1.3.4 Weight

TS model	:	Printer: 4.7 kg (without paper and ribbon) Supply Holder: 1 kg
HS model	:	Printer: 5.0 kg (without paper and ribbon) Supply Holder + Supply Cover : 2.5 kg

1.4 BASIC SPECIFICATIONS

1) Printing method ..... TS model: Thermal direct printing or thermal transfer printing
HS model: Thermal transfer printing

2) Print head (4 inches)

[TS model]
① Total number of dots ..... 1248 dots
② Dot density ..... 300 dpi (11.8 dots/mm)
③ Effective print width ..... 105.7 mm
④ Thermal pitch ..... 0.085 mm

[HS model]
① Total number of dots ..... 2496 dots
② Dot density ..... 600 dpi (23.6 dots/mm)
③ Effective print width ..... 103.6 mm
④ Thermal pitch ..... 0.042 mm

3) Print speed ..... TS model: 50.8 mm/sec., 101.6 mm/sec. (selectable)
HS model: 50.8 mm/sec.

***NOTE**: These print speeds are available when printing ratio is less than 15% of the entire label or tag paper.*

4) Format size (W) x (L) ..... Label: TS model:114.0 x 997.0 max., HS model: 110.0 x 997.0 max.
Tag Paper: 114.0 x 999.0 max. (TS model only)

5) Issuing mode ..... Batch printing (standard)
Auto cut (Auto cut mode is only available when an optional cutter is attached.)
Strip printing (Strip mode is only available when an optional strip module is attached.)

6) Type of bar code/two dimensional code
① JAN8, EAN8, JAN13, EAN13, UPC-A, UPC-B
② EAN8, EAN13, UPC-A, UPC-E+2 digit
③ EAN8, EAN13, UPC-A, UPC-E+5 digit
④ NW-7
⑤ CODE39 (STANDARD)
⑥ CODE39 (FULL ASCII)
⑦ ITF
⑧ MSI
⑨ CODE93
⑩ CODE128
⑪ EAN128
⑫ Data Matrix
⑬ PDF417
⑭ QR Code
⑮ industrial 2 of 5
⑯ Customer Bar Code
⑰ POSTNET
⑱ RM4SCC (ROYAL MAIL 4STATE CUSTOMERCODE)
⑲ KIX CODE
⑳ Maxi Code
㉑ Micro PDF417

7) Bar code rotation ..... 0°, 90°, 180°, 270°

8) Type of characters
① Times Roman medium (12, 15 point)
② Times Roman bold (15, 18, 21 point)
③ Times Roman Italic (18 point)
④ Helvetica medium (9, 15, 18 point)
⑤ Helvetica bold (18, 21 point)
⑥ Helvetica Italic (18 point)
⑦ Presentation bold (27 point)
⑧ Letter Gothic medium (14.3 point)
⑨ Prestige Elite medium (10.5 point)
⑩ Prestige Elite bold (15 point)
⑪ Courier medium (15 point)
⑫ Courier bold (18 point)
⑬ OCR-A,B (12 point)
⑭ Outline font (Helvetica bold/ Times Roman/Pop)
⑮ Price font 1, 2, 3
⑯ Writable Characters (10 types)...QQ, (45 types)...QP

9) Character code

[TS model]

① PC-850 ② PC-8 ③ PC-852 ④ PC-857

[HS model]

① PC-850 ② PC-8 ③ PC-852 ④ PC-857 ⑤ PC-851 ⑥ PC-855
⑦ PC-1250 ⑧ PC-1251 ⑨ PC-1252 ⑩ PC-1253 ⑪ PC-1254 ⑫ PC-1257
⑬ LATIN9 ⑭ ARABIC

10) Character magnification

① Regular font: 0.5 ~ 9.5 times (Between 0.5 and 1 times, magnification can be specified in steps of 0.1 time, thereafter, specified in steps of 0.5 times.)
② Outline font: 2.0 ~ 85.0 mm (magnified 0.1 mm in each direction)

***NOTE**: When the outline font size is large, the ribbon may wrinkle according to the quality of the ribbon or print tone.*

11) White or black background All types of characters are available

12) Character rotation ..... 0°, 90°, 180°, 270°

13) Character strings rotasion ..... 0°, 90°, 180°, 270°

14) Type of line

① Horizontal line ② Vertical line ③ Slant line ④ Square ⑤ Rounded Rectangle ⑥ Circle

15) Line Width ..... 1 dot to 12 dots can be specified (in units of 0.1 mm)
Guaranteed only when a line has more than 3 dots.

16) Mechanism

① Batch mechanism
This is the standard mechanism which let the printer print continuously without winding the label and tag paper. The strip or auto-cut function is available when the optional module is installed.

② Auto cut mechanism
When the cutter module is installed, the backing paper and tag paper are cut individually (stop and cut). Minimum cut length is 25.4 mm (tag paper) or 37.0 mm (label).

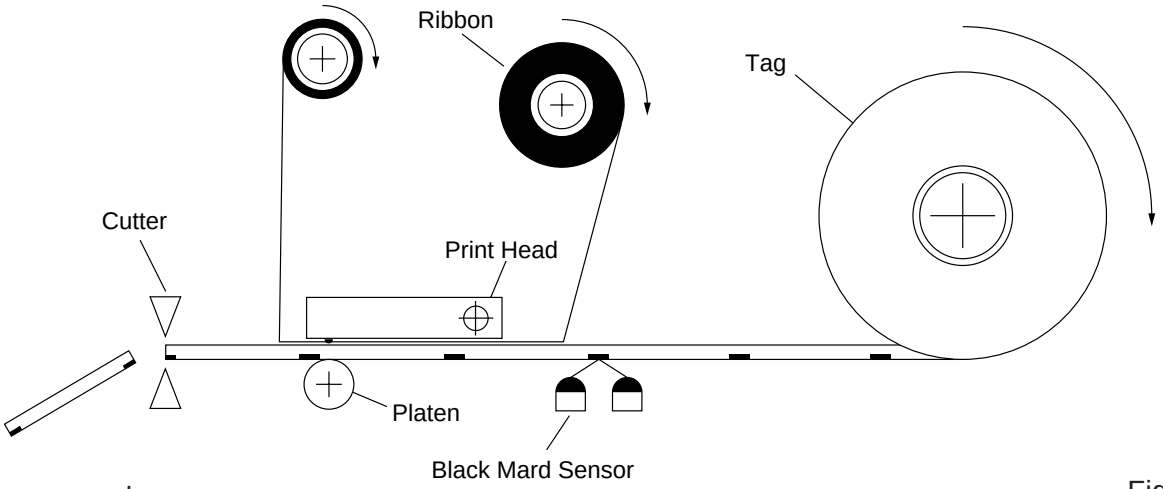


Fig. 1-4

17) Power supply

QQ model: AC100 ~ 120 V, 60 Hz
QP model: AC220 ~ 240 V, 50 Hz

18) Current consumption

[TS model]

QP model: 0.41 A, 74 W max. (standby: 0.15 A, 23.5 W)
QQ model: 0.94 A, 47 W max. (standby: 0.30 A, 18 W)

[HS model]

QP model: 0.90 A, 150 W max. (standby: 0.12 A, 17 W)
QQ model: 1.80 A, 140 W max. (standby: 0.22 A, 13.5 W)

19) Rush current ..... TS model: QQ model : 13.8 A or less, QP model : 12.5 A or less
HS model: QQ model : 13.8 A or less, QP model: 12.5 A or less

1.5 ELECTRONICS SPECIFICATIONS

1) CPU ..... V55PI (16 MHz), 120 Pin QFP (0.5 mm)
2) Memory
   ① Program: Flash ROM 2 MB
   ② Backup: EE-PROM 128 Bytes
   ③ Image buffer + Work: [TS model] D-RAM 2 MB (Image buffer 1792 KB, Work 256 KB)
   [HS model] D-RAM 4 MB (Image buffer 3840 KB, Work 256 KB)

   NOTE: *The 1 MB Flash ROM can be used for the QQ models manufactured before August "99 (Serial No. 9Nxxxxxx or earlier).*

3) Interface
   ① RS-232C interface
      (1) Communication mode: Full-duplex
      (2) Transmission speed: 2400,4800,9600,19200 BPS (selectable)
      (3) Synchronization: start-stop synchronization
      (4) Transmission parameter
         ■ Parity: None, EVEN
         ■ Start bit: 1-bit
         ■ Stop bit: 1-bit
         ■ Word length 8-bit
      (5) Error detection
         ■ Parity check: VRC (Vartical parity check)
         ■ Framing error: This error occurs when no stop bit is found in the frame specified startig with the start bit.
         ■ Overrun error: This error occurs when subsequent data is input before the data input to the UART from the host is read by the printer.
      (6) Data entry code: ASCII, 8-bit code for European characters, 8-bit code for graphic
      (7) Receiving buffer: 5 KB
      (8) Protcol
         ■ XON/XOFF (DC1/DC3) protocol
            • When initialized after power on, this printer becomes ready to receive data and sends an XON code (11H). (Trasmission or non-transmission of XON code is selectable by means of the DIP switch.)
            • The printer sends an XOFF code (13H) when the blank positions in the receive buffer becomes 800 Bytes or less.
            • The printer sends an XON code (11H) when the blank positions in the receive buffer are 2KB or more.
            • When there are no blank positions in the receive buffer, the printer discards data received which exceeds the receive buffer capacity, without storing it in the buffer. (After detecting the XOFF code, the host computer must stop transmission before the printer receive buffer becomes full.)
            • The ptinter sends an XOFF code (13H) at power off time. (XOFF code send is selectable with Dip switch.)

■ READY/BUSY (DTR) protocol

- When initialized after power on, this printer becomes ready to receive data and converts the DTR signal to "High" level (READY).
- The printer converts the DTR signal to "LOW" level (BUSY) when the blank positions in the receive buffer amount to 800 Bytes or less.
- The printer converts the DTR signal to "High" level (READY) when the blank position in the receive buffer amount to 2KB or more.
- When there are no blank position in the receive buffer, the printer discards data received which exceeds the receive buffer capacity, without storing it in the buffer.

  (After detecting a BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)

■ (READY/BUSY (RTS) Protocol

- When initialized after power on, this printer becomes ready to receive data and converts the RTS signal to "High" level (READY).
- The printer converts the RTS signal to "Low" level (BUSY) when the blank positions in the receive buffer amount to 800 bytes or less.
- The printer converts the RTS signal to "High" level (READY) when the blank position in the receive buffer amount to 2KB or more.
- When there are no blank position in the receive buffer, the printer discards data received which exceeds the receive buffer capacity, without storing it in the buffer. (After detecting a BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)
- The printer must keep the DTR signal "High" level, and the host must keep the DSR signal "High" level.

■ XON/XOFF (DC1/DC3) protocol + READY/BUSY (DTR) protocol

- When initialized after power on, this printer becomes ready to receive data and converts the DTR signal to "High" level (READY). The printer sends an XON code (11H).
- When the blank positions in the receive buffer are 800 Bytes or less, the printer converts the DTR signal to "LOW" level (BUSY) and sends an XOFF code (13H).
- When the bland positions in the receive buffer are 2KB or more, the printer converts the DTR signal to "High" level (READY) and sends an XON code (11H).
- When there are no blank positions in the receive buffer, the printer discards data received which exceeds the receive buffer capacity, without storing it in the buffer.

  (After detecting the XOFF code or BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)
- The printer sends an XOFF code (13H) at power off time.

(9) Pin description

Pin No.	Signal	I/O	Description
2	TD (Transmit Data)	O	Data line from which the printer sends data to the host (send data line). Logic "1" is "Low", and "0" "High". It is LOW (MARK) while no data is being sent.
3	RD (Received Data)	I	Data line from which the printer receives data from the host (receive data line). Logic "1" is "Low", and "0" "High". It is LOW (MARK) while no data is being sent.
4	DSR (Data Set Ready)	I	Input signal from the host. It must be "High" for the printer to receive data.
5	SG (Data Set Ready)	-	Ground line for all data and control signals.
6	DTR (Data Terminal Eeady)	O	Output signal to the host. When controlling the READY/ BUSY (DTR): • Indicates that the printer is ready to receive data. • When the receive buffer is nearly full, it is "Low", and when the buffer is nearly empty, it becomes "High". When controlling the READ/BUSY (RTS): After power is ON, it is always "High".
7	CTS (Clear to Send)	I	Input signal from the host. It must be "High" for the printer to send data.
8	RTS (Request to Send)	O	Output signal to the host. When controlling the READY/BUSY (DTR): • Indicates there is data to send to the host. • After power is ON, it is always "High". When controlling the READY/BUSY (RTS): • When the receive buffer is nearly full, it is "Low", and when the buffer is nearly empty, it becomes "High".

(10) Interface circuit

■ Input circuit ■ Output circuit

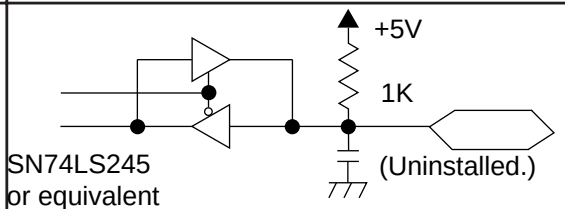
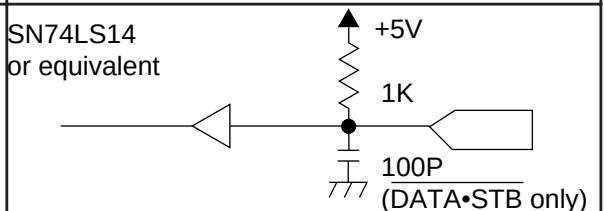
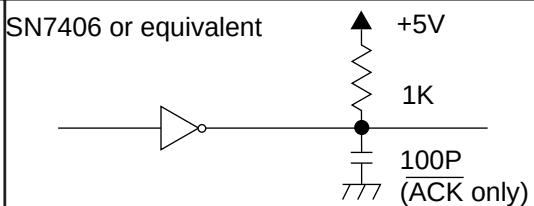
Fig. 1-5

■ Signal level

Input voltage : "H" .. +3V~ + 15V Output voltage : "H" .. +6V ~ +13V
"L"... –3V~ – 15V Output voltage : "L"... –6V ~ –13V

② Centronics interface

(1) Data input method: 8-bit parallel (DATA 1~8)
(2) Control signals: ACK, BUSY, PAUSE, DATA; STB, INPUT; PRIME, FAULT, PE
(3) Data input code: ASCII, JIS 8-bit code for European characters, 8-bit code for graphic
(4) Receiving buffer: 5KB
(5) Input/Output circuit configuration and Input/Output conditions

Type	Signal Name.	Configuration
Input	DATA 1 to 8	
	$\overline{\text{INPUT}}$ $\overline{\text{PRIME}}$ DATA $\overline{\text{STB}}$	
Output	$\overline{\text{BUSY}}$ $\overline{\text{FAULT}}$ $\overline{\text{PAUSE}}$ $\overline{\text{ACK}}$ PE	

Logical level (input)
"1" = 2 to 5V
"0" = 0 to 0.4V

Logical level (input)
"1" = 2.4 to 5V
"0" = 0 to 0.4V

Fig. 1-6

4) Sensor/Switch

① Head up switch (micro switch)
The head up switch is located on the lower left side and back end of the printer frame.
This switch detects that the print head is in the print position (head is down) when the print head block is lowered and the arm on the left side of the print head block turns ON the switch.

② Media sensor

[TS model]

This sensor, comprised of the black mark sensor and feed gap sensor, is located in two parts on the back side of the printer, part on the bottom rear of the paper guide base and part on the sensor holder.

[HS model]

This sensor, comprised of the black mark sensor and feed gap sensor, is located in two parts on the front side of the printer, part on the bottom front of the paper guide base and part on the sensor cover. For the HS model, the position of the media sensor can be adjusted in 5 steps in both left and right direction.

- Black Mark Sensor (Reflective sensor)
  This is a fixed sensor which detects black marks at the center of the tag paper.
- Feed Gap Sensor (Transmissive sensor)
  This is a fixed sensor which detects label gaps at the center of the label.

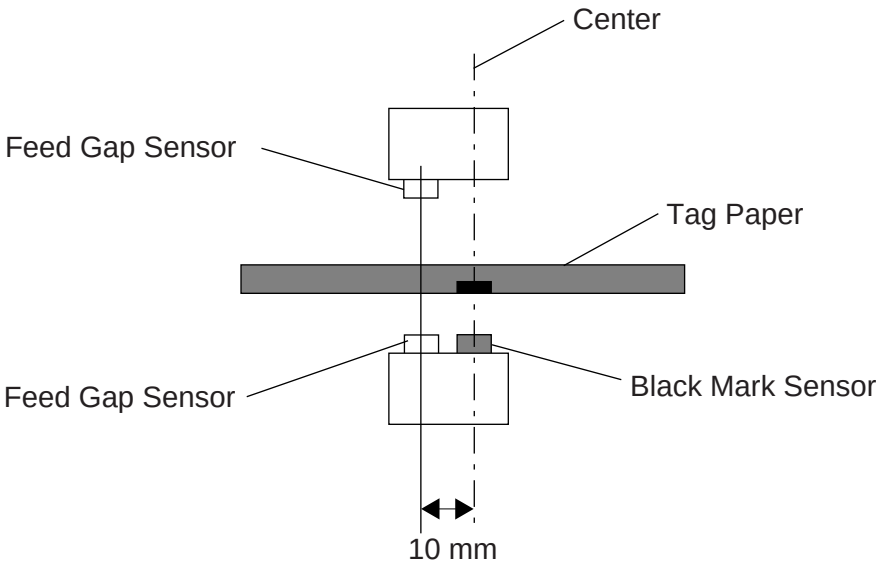


Fig. 1-7

③ Slit sensor (Transmissive sensor)
This sensor detects the rotation count of the ribbon slit gear and the ribbon motors. The ribbon motors torque works to take up slack in the ribbon and is dependent on the detected count.
The slit sensor is a photo coupler combining an LED and a transistor.
The slit sensor (feed) also detects a ribbon end. When the ribbon has been used up, the ribbon slit gear stops and the slit sensor does not turn on and off.

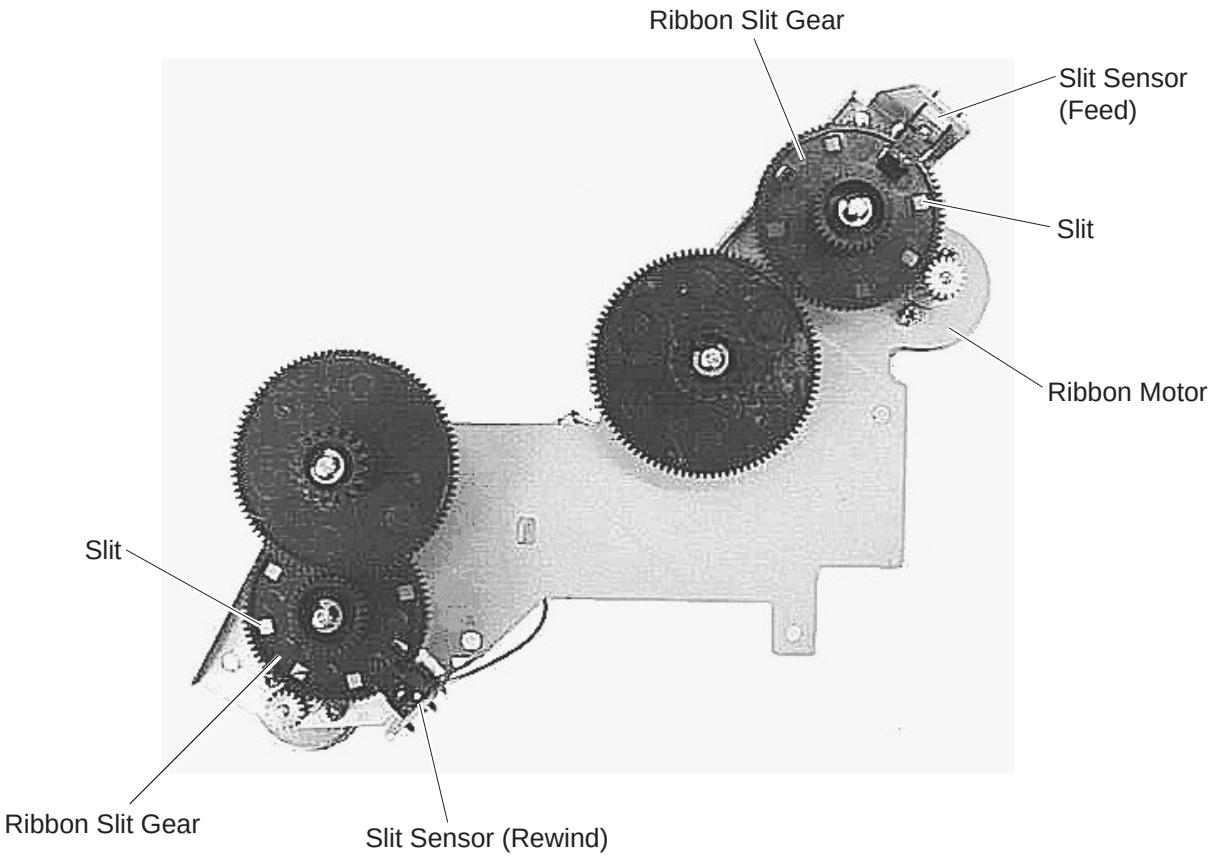


Fig. 1-8

④ Cutter home position switch (micro switch)
A cam positioned at the right side of the cutter turns the micro switch on/off in accordance with the cycle of the cutter motion (half rotation). The micro switch status indicates if the cutter is in the home position.

⑤ Cutter cover open switch (micro switch)
The cutter cover open switch is located on the lower front part of the cutter unit.
This switch detects that the cutter cover is opened when the tab of the cutter cover is released from the actuator arm and the micro switch turns OFF.

2. SUPPLY SPECIFICATIONS

Infomation regarding the supply specifications contained in Product Description is essential to service engineers. Detail specifications and other information on the paper and ribbon are described in Supply Manual by model. It is issued by and sent from TOSHIBA TEC H.Q (Sales Division) upon release of new model or manual's revision. When purchasing the supplies locally, be sure to refer to the Supply Manual for details, or trouble may occur. Be sure to read carefully and understand the Supply Manual since if also includes the details about notes, precision of the print start position, limitations on printing, etc.

2.1 PAPER

[TS model]

Type / Item	Label			Tag Paper	
	Batch	On-demand	Auto-cut	Batch	Auto-cut
Width (mm)	25.4 ~ 114.0			25.4 ~ 114.0	
Length (mm)	15.0 ~ 999.0	25.4 ~ 999.0	37.0 ~ 999.0	15.0 ~ 999.0	25.4 ~ 999.0
Thickness (mm)	0.10 ~ 0.17	0.13 ~ 0.17	0.10 ~ 0.17	0.10 ~ 0.17, (0.17 ~ 0.263)	
Outer roll diameter (mm)	152.4 max.			152.4 max.	
Recommended paper	RICOH: 130LAB-1			I-BEST S, I-BEST W	

NOTES:
1. *When cutting the label, secure a gap of 6 mm or more and cut in the middle of the gap.*
2. *The thermal paper used for direct thermal printing must not have the specifications which exceed Na^+ 800 ppm, K^+ 250 ppm and Cl^- 500 ppm.*
3. *Some ink used on pre-printed labels may contain ingredients which shorten the print head's product life. Do not use labels pre-printed with ink which contain hard sub–stances such as carbonic calcium ($Ca\ CO_3$) and kaolin (Al_2O_3, $2SiO_2$, $2H_2O$).*
4. *The label should be at least three times as long as the detection gap.*
5. *Relations between media roll length and core diameter.*

$$L = \frac{(D^2 - d^2) \times \pi}{4t}$$

L: Paper length *d: Paper core outside diameter*
D: Max. roll diameter *t: Paper thickness*

6. *Use of paper with a width less than the minimun paper width may shorten the print head life.*
7. *Use of paper which is narrower than the specified minimum width may shorten the print head life.*
8. *Only for the tag paper 25.4 mm to 37.0 mm in width, the thickness ranges from 0.10 mm to 0.26 mm.*
9. *Paper width when using 0.17 to 0.263 mm-thick tag paper must be 25.4 to 37 mm.*

1) Label

<Design>

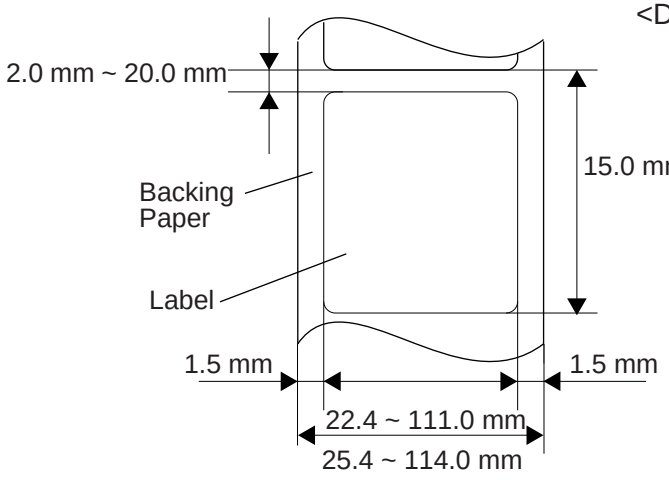


Fig. 2-1

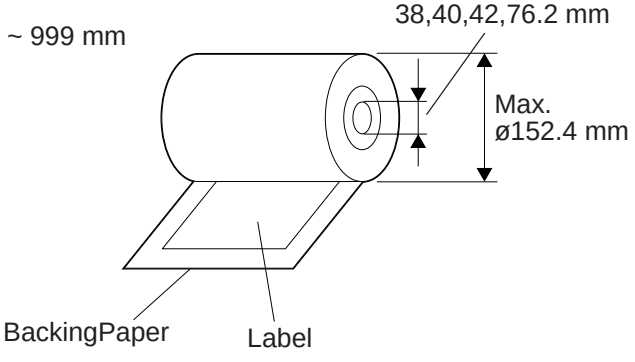


Fig. 2-2

2) Tag Paper

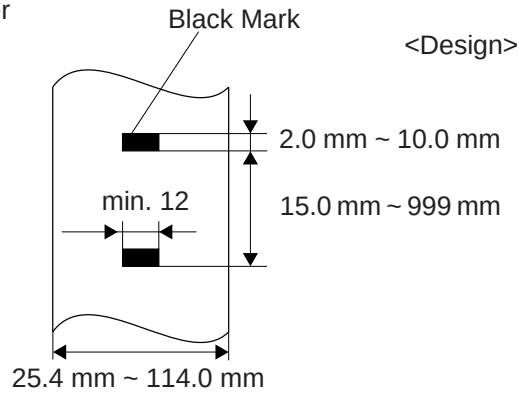


Fig. 2-3

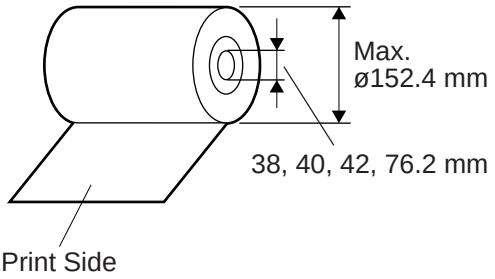


Fig. 2-4

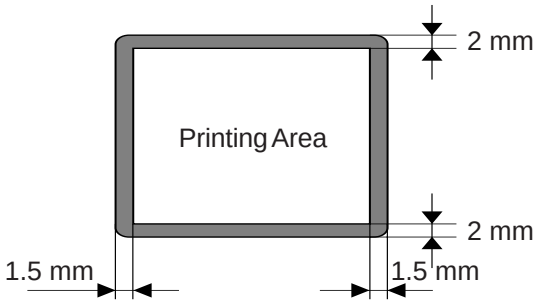


Fig. 2-5

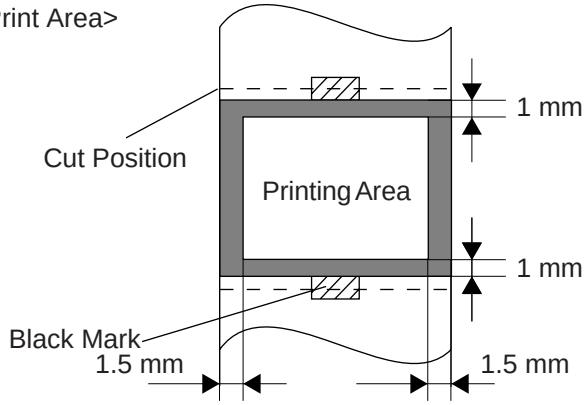
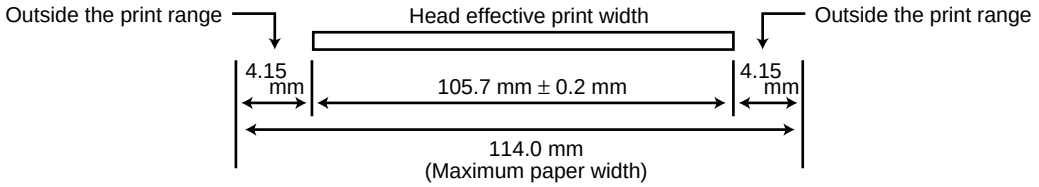


Fig. 2-6

***NOTE**: Max. effective print area is 105.7 mm (W) x 981.3 mm (L).*

3) Relationship between the head effective print width and paper.



[HS model]

Type / Item	Label		
	Batch	On-demand	Auto-cut
Width (mm)	25.4 - 110.0		
Pitch (mm)	7.0 - 999.0	25.4 - 999.0	37.0 - 999.0
Length (mm)	5.0 - 997.0	23.4 - 997.0	31.0 - 993.0
Thickness (mm)	0.10 - 0.17	0.13 - 0.17	0.10 - 0.17
Shape	Roll paper wound inside.		
Outer roll diameter	152.4 mm max.		
Paper core (mm)	Inner diameter ø38, 40, 42, 76.2 ± 0.3		
Recommended paper	LINTEC: FR1510-50 SILVER PET LINTEC: FR1412-50 WHITE PET		

NOTES:

1. *The thickness of the backing paper should be 56µm or more.*
2. *The label should be at least three times as long as the detection gap.*
3. *The max. paper width includes the backing paper width.*
4. *Use Glassine paper 7K, 8K, or equivalent type for the backing paper. (Transparency rate should exceed 22%.)*
5. *Relations between media roll length and core diameter.The unit of measure should be unified.*

$$L = \frac{(D^2-d^2) \times \pi}{4t}$$

L: Paper length *d: Paper core outside diameter*
D: Max. roll diameter *t: Paper thickness*

6. *When using the cutter, be sure to cut the gap between labels. Perforated labels should be tested before use.*
7. *When cutting the label, secure a gap of 6 mm or more and cut in the middle of the gap.*
8. *Fanfold paper cannot be used.*
9. *How to fix the label stock to the paper core*

   Remove the labels from the backing paper for the minimum of 400 mm long and fix the backing paper edge to the paper core as shown below. Failure to do this may cause a void print because the powder on the paper core surface may be attached to the label which contacts with the paper core.

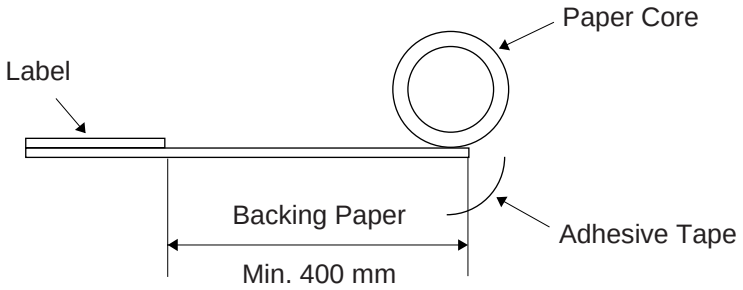


Fig. 2-7

2.2 RIBBON

No.	Item		Specification
1	Shape		Spool type
2	Width		60, 90, 110
3	Max. length		TS model: 300 m, HS model: 270 m
4	Max. OD		Ø65 mm
5	Back treatment		Coated
6	Core	Material	Cardboard
		Shape	See Fig. 2-8.
7	Leader tape		Polyester film (opaque), 260±5 mm long
8	Winding method		The ink side is outside of ribbon winding.

<Core Shape>

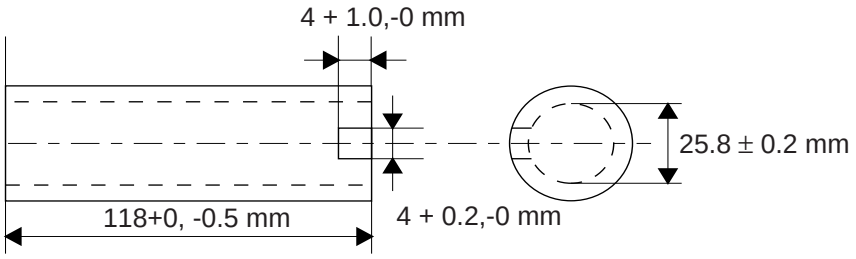


Fig. 2-8

***NOTE**: When purchasing ribbon locally, they must meet the above size. There may be TOSHIBA TEC-approved ribbons which do not fall within the above size, however, they have no functional problem.*

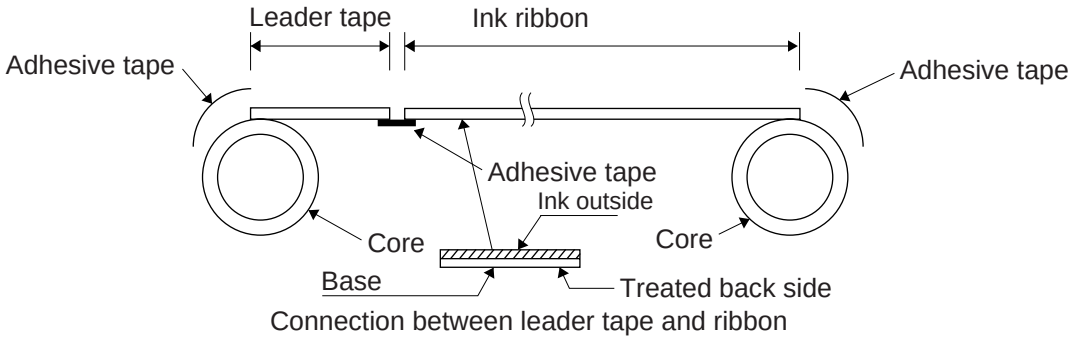


Fig. 2-9

2.3 CARE AND HANDLING OF THE PAPER AND RIBBON

***CAUTION**:*
Be sure to read carefully and understand the Supply Manual. Use only paper and ribbon which meet specified requirements. Use of non-specified paper and ribbon may shorten the head life and result in problems with bar code readability or print quality. All paper and ribbon should be handled with care to avoid any damage to the paper, ribbon or printer. Read the following guideline carefully.

- Do not store the paper and ribbon for longer than the manufactures recommended shelf life.
- Store paper rolls on the flat end, do not store them on the curved sides as this might flatten that side causing erratic paper advance and poor print quality.
- Store the paper in plastic bags and always reseal after opening. Unprotected paper can get dirty and the extra abrasion from the dust and dirt particles will shorten the print head life.
- Store the paper and ribbon in a cool, dry place. Avoid areas where they would be exposed to direct sunlight, high temperature, high humidity, dust or gas.
- The thermal paper used for direct thermal printing must not have the specifications which exceed Na^+ 800 ppm, K^+ 250 ppm and CL-500 ppm.
- Some ink used on pre-printed labels may contain ingredients which shorten the print head's product life. Do not use labels pre-printed with ink which contain hard substances such as carbonic calsium ($CaCO_3$) and kaolin (Al_2O_3, $2SiO_2$, $2H_2O$).
- Avoid using paper containing SiO_2 or talc which wears the print head protection layer.

For further information please contact your local distributor or your paper and ribbon manufacturer.

3. OPTIONAL KIT

Option Name	Type	Use
Cutter module	B-7204-QM	This cutter module uses a rotary cutter. It cuts backing paper of labels and tag paper automatically in "stop and cut" mode.
Strip module	B-7904-H-QM	This strip module strips the label from the backing paper with the take-up block and strip block. When the rewinder guide plate is attached, the tag paper and label with backing paper are wound.
Programmable Keyboard module	KB-80-QM	This module is an external intelligent keyboard unit.
Expansion I/O interface board (TS model only)	B-7704-IO-QM	Installing this board in the printer allows a connection with an external device with the exclusive interface, such as the Keyboard module.
Centronics interface board (TS-QQ model only)	B-7704-C-QM	Installing this board in the printer allows a connection with a PC by the Centronics parallel interface.
LAN I/F Board (TS model only)	B-7704-LAN-QM	This board enables the printer to be used in a LAN network by using the command language.

NOTE: *To purchase the OPTIONAL KIT, please contact your authorized TOSHIBA TEC representative or TOSHIBA TEC Head Quarter.*

3.1 CUTTER MODULE: B-7204-QM

This compact cutter module uses a built-in rotary cutter. The specification is provided below:

① Cutting method ..... Rotary cut
② Cut mode ..... Stop cut
③ Cut width ..... 25.4 ~ 114.0 mm
④ Cut length ..... Tag paper:25.4 ~ 999.0 mm, Label:37.0 ~ 999.0 mm
⑤ Thickness ..... 100.0 ~ 170.0 μm
⑥ Home position switch .... Micro switch

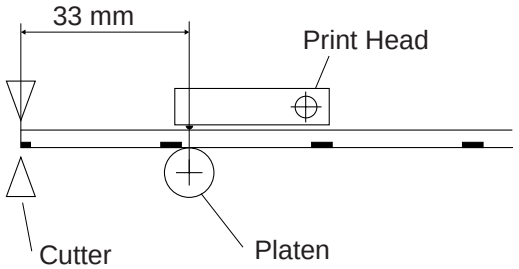


Fig. 3-1

3.2 STRIP MODULE: B-7904-H-QM

This strip module strips labels from the backing paper one by one using an exclusive DC motor which turns the strip roller to feed the backing paper. No backing paper take-up is provided.

① Print speed: TS model: Max.4 ips, HS model: Max. 2 ips
② Available minimum label length: 25.4 mm
③ Available minimum label width: 25.4 mm

3.3 KEYBOARD MODULE: KB-80-QM

This keyboard is equipped with 16 digits x 2 lines LCD and 28 key switches.

Built-in basic interpreter allows.

① Display
16 digits x 2 lines LCD
② Key switch
Numeric and function keys

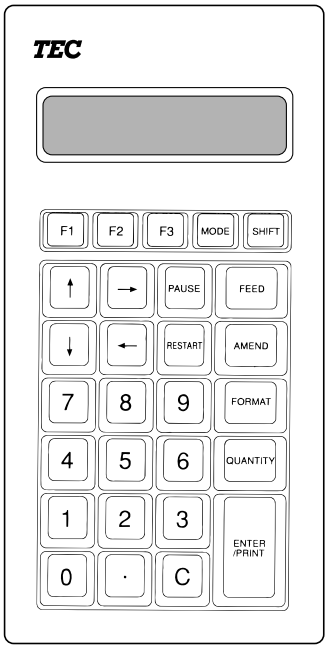


Fig. 3-2

③ Interface
(1) RS232C: 2 channels
Channel 1: 8-pin-DIN connector (with approx. 1 m cable)
Channel 2: 9-pin DSUB connector
(2) Pin Description

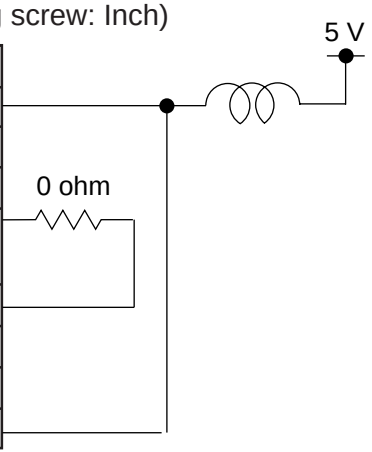
To printer (8-pin DIN)

Pin No.	Signal	I/O
1	GND	
2	GND	
3	RXD	Input
4	TXD	Output
5	$\overline{\text{CTS}}$	Input
6	$\overline{\text{RTS}}$	Output
7	+5V	Input
8	+5V	Input

Shield to frame ground

To PC 9-pin DSUB female (Locking screw: Inch)

Pin No.	Signal	I/O
1	-	
2	TXD	Output
3	RXD	Input
4	-	
5	GND	
6	-	
7	$\overline{\text{CTS}}$	Input
8	$\overline{\text{RTS}}$	Output
9	-	



④ Power supply
5V (Supplied through the DIN connector) 5V±5%
⑤ Memory
(1) Flash memory: 8 M bit
(2) SRAM: 32 K byte
⑥ Buzzer: Installed.

3.4 EXPANSION I/O INTERFACE BOARD: B-7704-IO-QM (TS MODEL ONLY)

This interface board is used to connect the printer to external devices, such as a labeler.
The input/output signals from the connected external devices can control label feeding or printing and indicates the printer state.

① Pin description: (FCN-685J0024 connector or equivalent)

Pin No.	Signal	I/O
1	IN0	Input
2	IN1	Input
3	IN2	Input
4	IN3	Input
5	IN4	Input
6	IN5	Input
7	OUT0	Output
8	OUT1	Output
9	OUT2	Output
10	OUT3	Output
11	OUT4	Output
12	OUT5	Output

Pin No.	Signal	I/O
13	OUT6	Input
14	N. C	-
15	COM1	-
16	N. C	-
17	N. C	-
18	N. C	-
19	N. C	-
20	N. C	-
21	COM2	-
22	N. C	-
23	N. C	-
24	N. C	-

NOTE: *Controller side connector: FCN-781P024-G/P Connector or equivalent*

② Input circuit

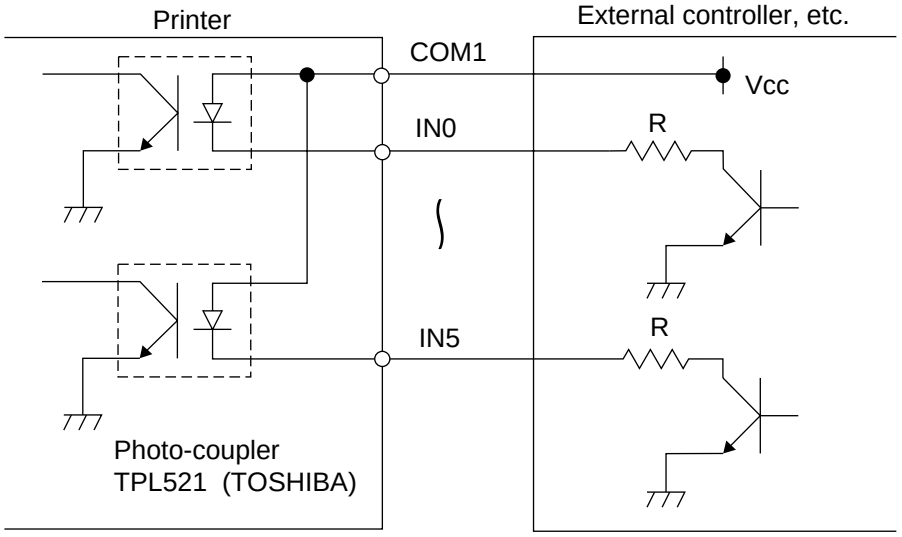


Fig. 3-3

There are six input circuits, and each input is a current loop using a photo-coupler.
The anode of the photo-coupler is connected to common pin COM1 in each of the five circuits. Each cathode is independent. The voltage of Vcc is 24 V (max.) while the diode operating current is 16 mA.

③ Output circuit

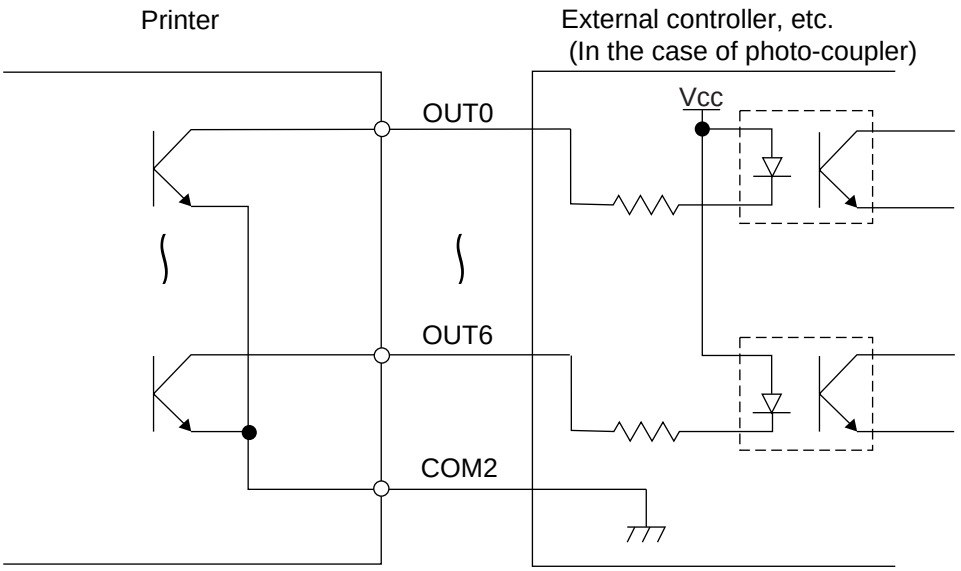


Fig. 3-4

There are seven output circuits, and each output is an open collector. The voltage of Vcc is 24V (max.) while the operating current is 150 mA.
For other details, please refer to the Expansion I/O specification.

④ Signal description

[Input]

IN0:	Feed	Feeds a label.
IN1:	Print	Prints a label.
IN2:	Pause	Pauses printing.
IN3:	Not used.	
IN4:	Not used.	
IN5:	Not used.	

[Output]

OUT0:	Feeding	The printer is feeding labels.
OUT1:	Printing	The printer is printing labels.
OUT2:	Pausing	The printer is pausing.
OUT3:	Error state	The printer is in error state.
OUT4:	Not used.	Always OFF.
OUT5:	POWER ON	The printer power is ON.
OUT6:	Not used.	Always OFF.

3.5 CENTRONICS INTERFACE BOARD: B-7704-C-QM (TS MODEL ONLY)

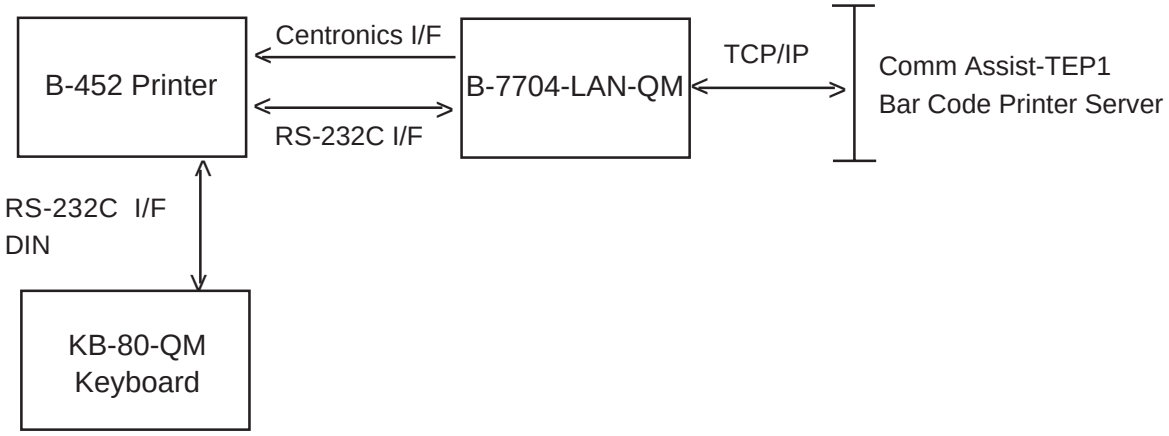
The B-7704-C-QM optional Centronics interface board has been developed for establishing the communication between printer and PC via the Centronics interface.

① Kind: Centronics Interface
② Data Input: 8 bit Parallel
③ Control Signal: ACK, BUSY, PAUSE, DATA•STB, FAULT, PE, INPUT•PRIME
④ Data Input Code: ASCII Code, European Character Set 8 bit Code, Graphic 8 bit Code, JIS 8 Code, Shift JIS Kanji Code, JIS Kanji Code

3.6 LAN I/F BOARD: B-7704-LAN-QM (TS MODEL ONLY)

Installing this LAN I/F board into the printer can connect the printer and the host by means of Local Area Network and 10BASE-T.

(1) Connection



(2) Protocol

1) Specifications

LAN Hardware	Standard	Ethernet V2.0 (10BASET)
	Transmission modulation method	Base band method
	Media access	CSMA/CD (Bus structure)
LAN Protocol	Protocol	TCP/IP
	Physical Layer	Ethernet V2.0 (Conforming to IEEE802.3)

2) Communication Session

Control Session: TELNET Server
240 seconds is set as the inactivity timer.

Data Session: TCP Port for Centronics I/F Output (1 session)
TCP Port for RS-232C I/F Output (1 session)
LPR server (1 session)

(3) B-7704-LAN-QM Initial Setting before shipment

Item	Parameter	TELNET Setting
Operation Mode	Socket Mode	Impossible
Data format for socket communication	Transparent Clear the receive buffer at communication.	Impossible
My IP Address	190.238.254.254	Possible
Sub Net Address	0.0.0.0 (Not Used)	Possible
Gateway IP Address	0.0.0.0 (Not Used)	Possible
TCP Port No. for communication by RS-232C I/F	1111	Possible
TCP Port No. for communication by Centronics I/F	2222	Possible
Client Connection	Enable (Used)	Impossible
Server IP Address	0.0.0.0 (Not Used)	Possible
TCP Port no. of server	0 (Not Used)	Possible
Connection retry count	10 times	Possible
Connection Trigger	Connected by the receive data. Disconnected by the timer.	Possible
Disconnection Timer value	90 seconds	Possible
Receive Control Timer	60 seconds	Impossible
RS-232C I/F Protocol	Baud Rate: 38400 bps Data Length: 8 bits Parity: EVEN Stop Bit: 1 bit Protocol: XON/XOFF without Flow Control	Possible
ER Signal	ON status by turning the printer power ON	Impossible
Password for the management TELNET	None	Impossible

NOTES: *1. In the TELNET setting, select applicable items from the menu and enter each setting value. Then selecting* ***[Save changes to EE_PROM restart CommAssist]*** *in* ***[5) Exit]*** *performs EE_PROM writing and restarting the printer.*

2. The RS-232C I/F Protocol of the B-7704-LAN-QM should be the same as that of the printer.

(4) Printer Interface (RS-232C Interface)

1) Communication mode: Full-duplex
2) Synchronization method: Start-stop synchronization
3) Transmission speed: 2400 to 19200 bps
   Selectable by the printer DIP switch setting
   Initial setting from the printer is 9600 bps.
4) Start bit: 1-bit
5) Data length: 8-bits
6) Parity: NONE/EVEN
   Selectable by the printer DIP switch setting
   Initial setting from the RS-232C is NONE.
7) Stop bit: 1-bit
8) Flow control: XON/XOFF with/without flow control
   Initial setting from the RS-232C is XON/XOFF without flow control.
9) Data entry code: ASCII code, Shift JIS code

NOTE: *At the B-7704-H-QM initial setting mode, the printer's transmission speed and parity should be set to 9600 bps and NONE with the DIP switch, respectively.*

10) Connector Pin and Signal Description

B-452 Printer		Direction of signal	B-7704-LAN-QM		Description
Pin No.	Signal Name		Pin No.	Signal Name	
1	GND	-	1	GND	-
2	GND	-	9	GND	-
3	RD	←	3	TD	Data line from which the printer receives data from the B-7704-LAN-QM.
4	TD	→	2	RD	Data line from which the printer sends data to the B-7704-LAN-QM.
5	CTS	←	5	RTS	Imput signal from the B-7704-LAN-QM. (It is always "High".)
6	RTS	→	4	CTS	Output signal to the B-7704-LAN-QM (After power is ON, it is always "High".)
7	+5V	←	6	+5V	-
8	+5V	→	None	-	-

(5) Printer Interface (Centronics Interface)

It is a parallel output port for the data received from the Ethernet. Signals SELECTIN and INIT should not be used. For signals PE, SELECT, ERROR, their states are only indicated by the TELNET. They should not have any effect on data transmission.

The data received from the Ethernet is output to the Centronics via the 16-KB ring buffer.

(6) LED Function

LED	Function
ON-LINE LED (STATUS LED 1)	ON (Green): Operating Mode ON (Orange): Diagnostic RAM Test (Power ON) Blink (Orange): RARP output, Loop Back Test (Power ON) Blink (Red): System Error (Synchronizes with the ERROR LED) ON (Orange) → OFF: Returns to the factory default setting.
ERROR LED (STATUS LED 2)	OFF: Operating Mode (Wait status) or while initializing ON (Green): Data Receive Blinks once (Red): External Ethernet Loop Back Error Blinks twice (Red): NV-RAM Error Blinks three times (Red): RAM Error Blinks four times (Red): Internal Ethernet Loop Back Error Continuous blink (Red): System Error (Synchronizes with the ON-LINE LED)

(7) Dip Switch Function
CPU reads the status of Dip switch when the power is turned ON.

Dip Switch (ON/OFF)				Function	Remarks
1	2	3	4		
OFF	**OFF**	**OFF**	**OFF**	**Operating Mode**	**Factory default setting**
OFF	OFF	OFF	ON	C-F1 Mode	Not used.
ON	ON	ON	ON	The factory default setting is written into the ROM.	Initial Mode (Not used.)

(8) Jumper Pin Function

No.	Function	Initial
JP1	SG/FG Short Available: Short None: Open	None: Open
JP2	Centronics Interface Logic Select Available: Original logic Non: Reverse	None: Reverse
JP3	P-ROM/F-ROM Select Pins 1-2: F-ROM Pins 2-3: P-ROM	Pins 1-2: F-ROM
JP4	S-RAM Size Select Pins 1-2: 1M Byte Pins 2-3: 256K Byte	Pins 2-3: 256K Byte

TEC
TOSHIBA TEC CORPORATION

PRINTED IN JAPAN
EO10-33003A

TEC Thermal Printer

B-450 SERIES

Maintenance Manual

Document No. **EO18-33003A**

Original **Dec., 1998**

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CAUTION:

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2. *The contents of this manual may be changed without notification.*
3. *Please refer to your local Authorized Service representative with regard to any queries you may have in this manual.*

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570 Ohito, Ohito-cho, Tagata-gun, Shizuoka-ken, JAPAN

1. UNPACKING

1.1 PROCEDURE

1) Open the carton.
2) Unpack the side pads (L)/(R) and cushions and the printer from the carton.
3) Unpack the accessories from the carton.

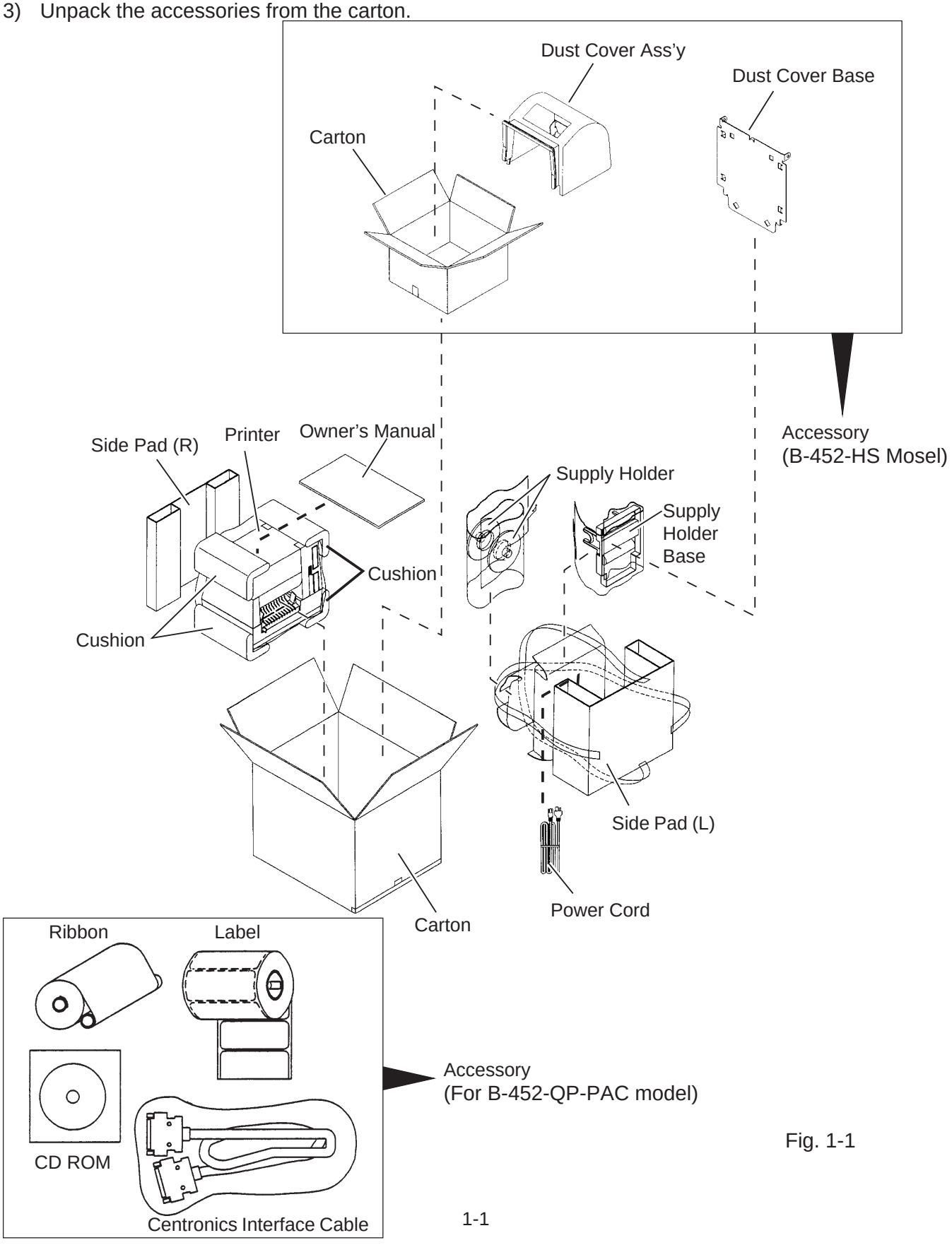


Fig. 1-1

4) Remove the three pieces of tape from the printer.

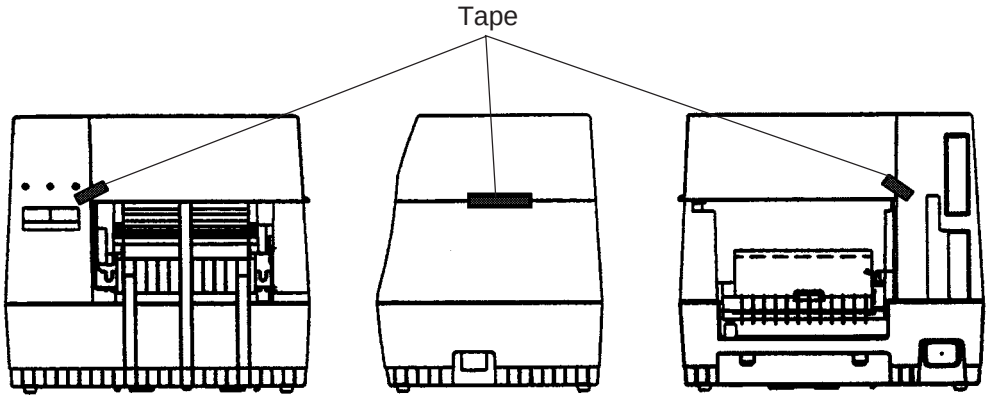


Fig. 1-2

5) Open the top cover.
6) Remove the three pieces of tape and print head pad from the printer.

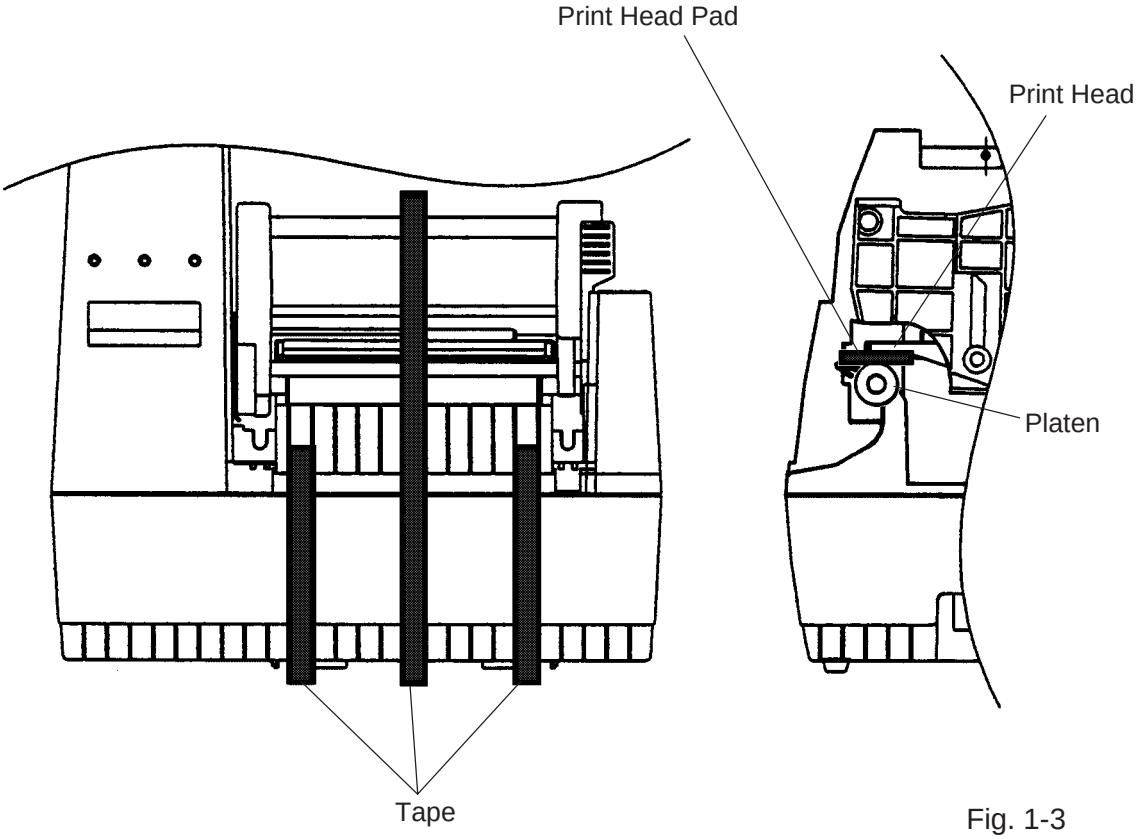


Fig. 1-3

7) Place the printer on a level surface.

1.2 CHECKS

1) Check for damage or scratches on the printer.
2) Confirm that none of the accessories are missing.

NOTE: *Keep the carton, pads and cushions for later transport.*

2. MAJOR UNIT REPLACEMENT

WARNING!
Disconnect power cord before replacing important parts.

■ Lubrication

> ***CAUTION:*** *1) Lubrication: During parts replacement*
> *2) Kinds of oil: Kinds of oil: FLOIL G-488: 1Kg can. (Part No. 19454906001).*

Any machine is generally in its best condition when delivered; therefore, it is necessary to try to keep this condition. Unexpected failure occurs due to lack of ioil, debris or dust. To keep its best condition, periodically clean the machine and apply proper kinds of oil to each part in which lubrication is needed. Although the frequency of lubrication varies according to how much the machine is used, at least it is necessary to lubricate before the machine becomes dry. It is also necessary to wipe off excessibe oil as it collects dirt.

> ***CAUTION:*** *Do not spray the inside of the printer with lubricants. Unsuitable oil can damage the machanism.*

2.1 REPLACING THE CPU PC BOARD

NOTE: *For the B-452-HS model, the following PC boards need to be removed before removing the CPU PC board. Refer to the sections below.*
Head Control PC Board (Refer to Section2.5.)
600 DPI EXPIO PC board (Refer to Section 2.7.)
Centronics interface Board (Refer to Section 3.2.)

1) Turn the power off.
2) Open the top cover.
3) Remove the two PT-3x10 screws to detach the top cover.

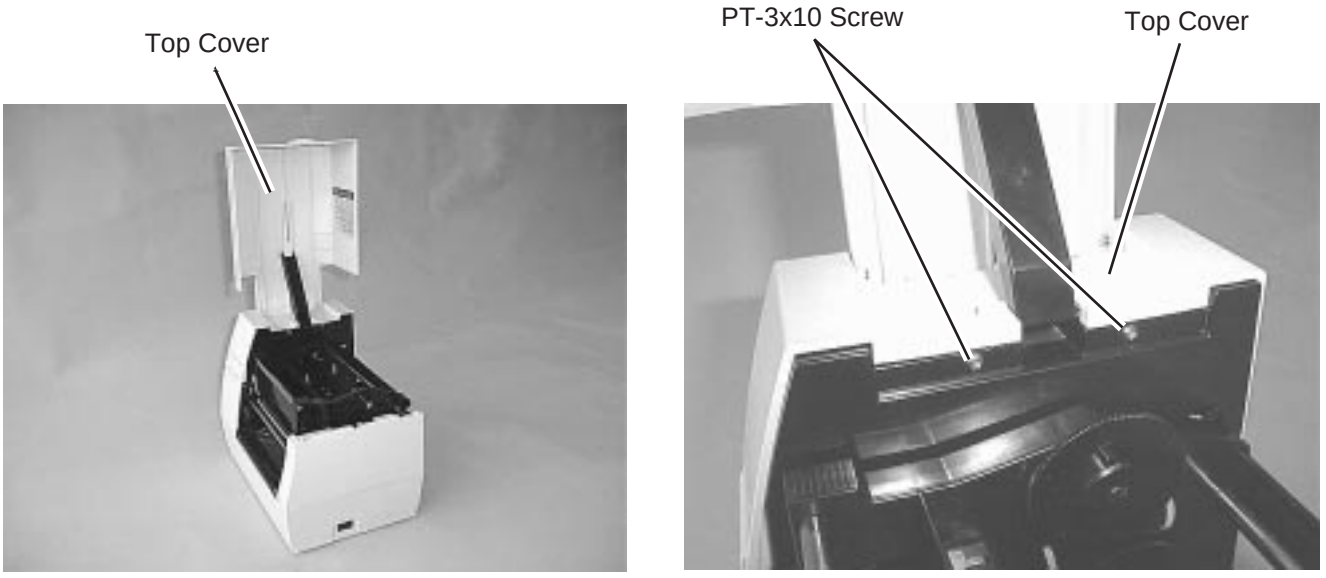


Fig. 2-1

4) Disconnect the nine harnesses from CN3 to CN5, CN9, CN12, CN13, CN14, CN20 and CN21 on the CPU PC board.

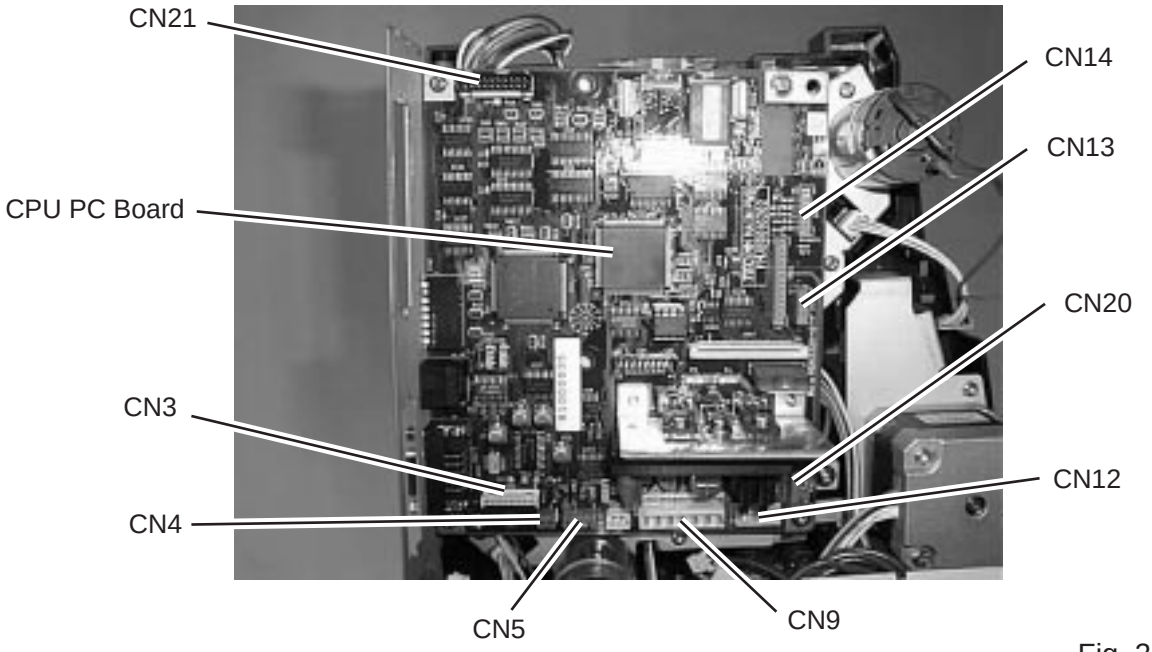


Fig. 2-2

5) Remove the five PT-3x10 screws, the two SMW-3x6 screws and the ground wire to detach the CPU PC board.

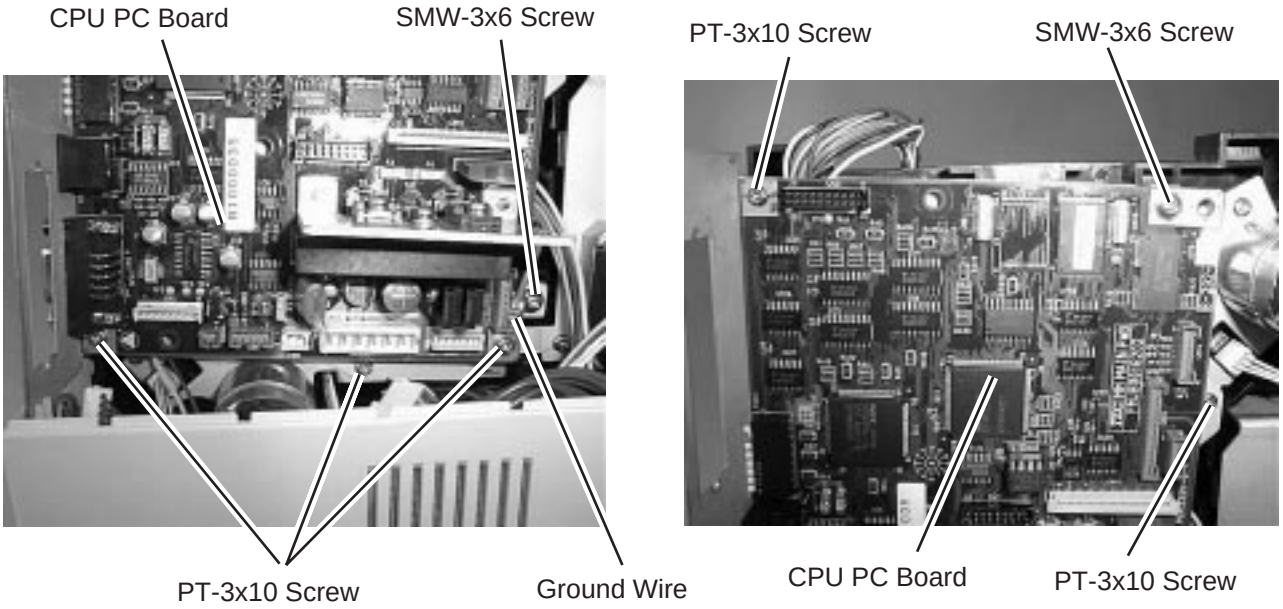


Fig. 2-3

6) Replace the CPU PC board with a new one, and then reassemble in the reverse order of removal.

2.2 REPLACING THE MOTOR

Before removing the motors, refer to Section 2.1 to detach the top cover and CPU PC board.

2.2.1 Ribbon Motor

1) Remove the two PT-3x10 screws and harnesses to detach the ribbon motor attaching plate.

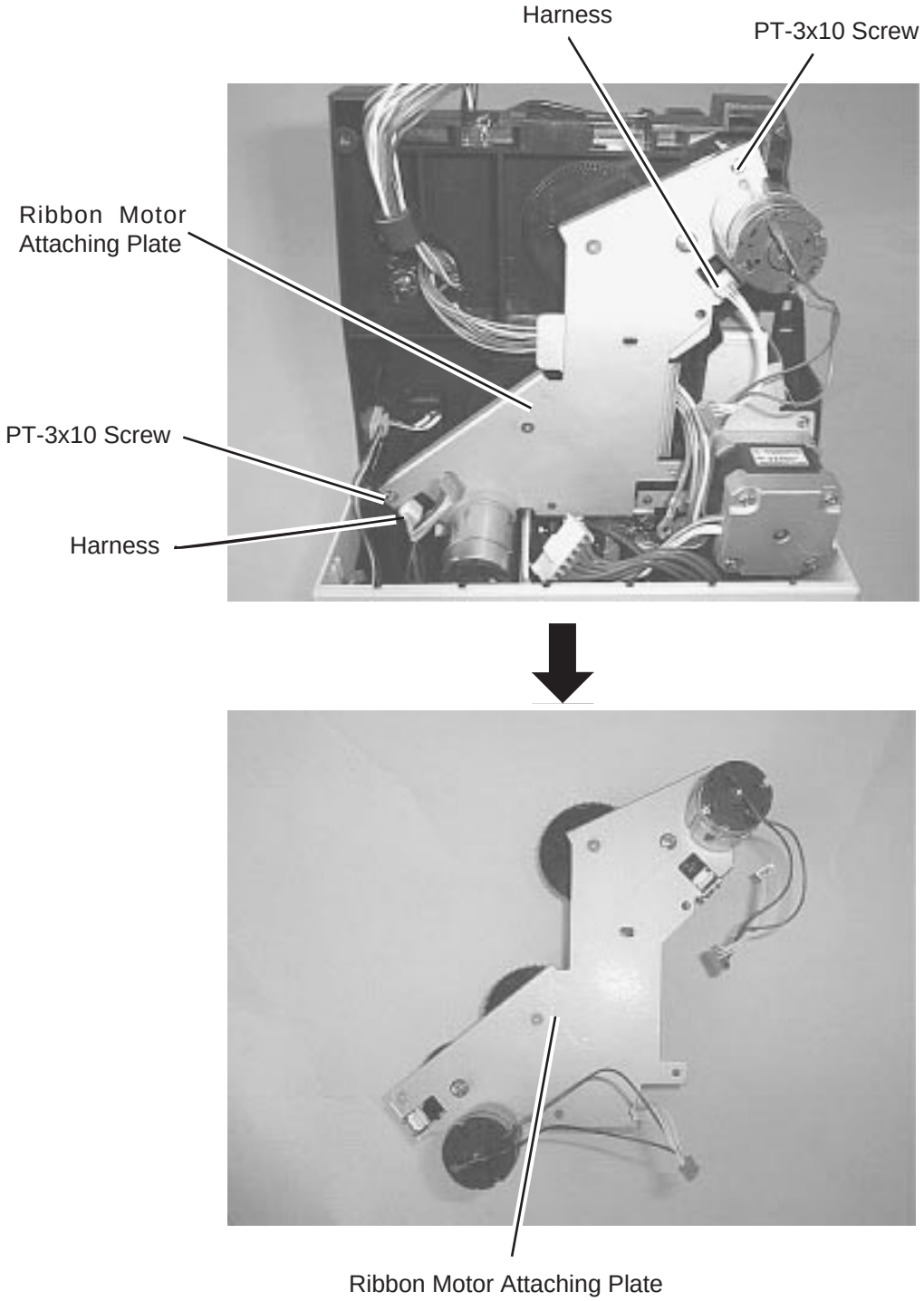


Fig. 2-4

2) Remove the four SMW-2.6x6 screws to detach the two ribbon motors from the ribbon motor attaching plate.

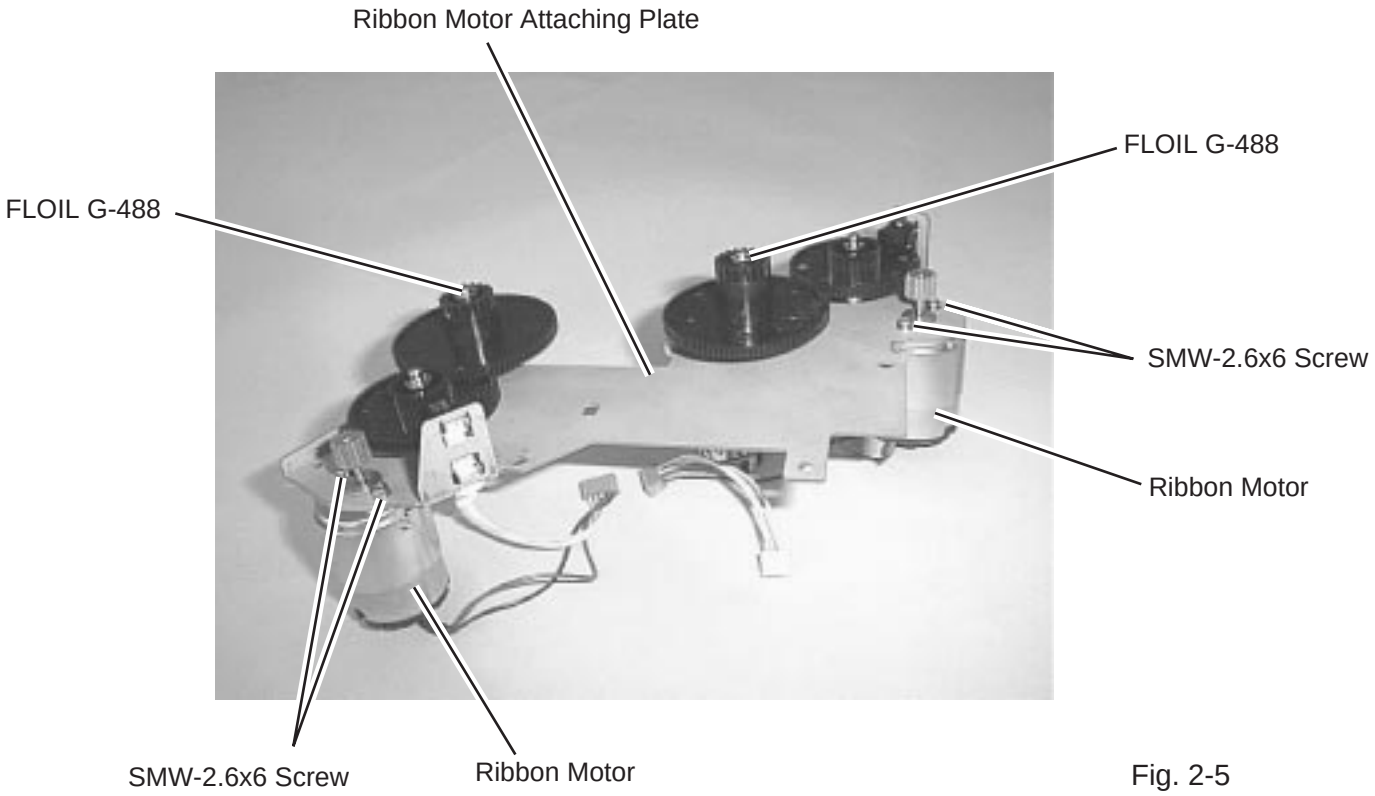


Fig. 2-5

3) Replace the ribbon motors with new ones, and then reassemble in the reverse order of removal.

2.2.2 Stepping Motor

WARNING!
Be careful not to get burned when handling the stepping motor since it becomes very hot while printing.

1) Remove the two PT-3x10 screws to detach the stepping motor ass'y.

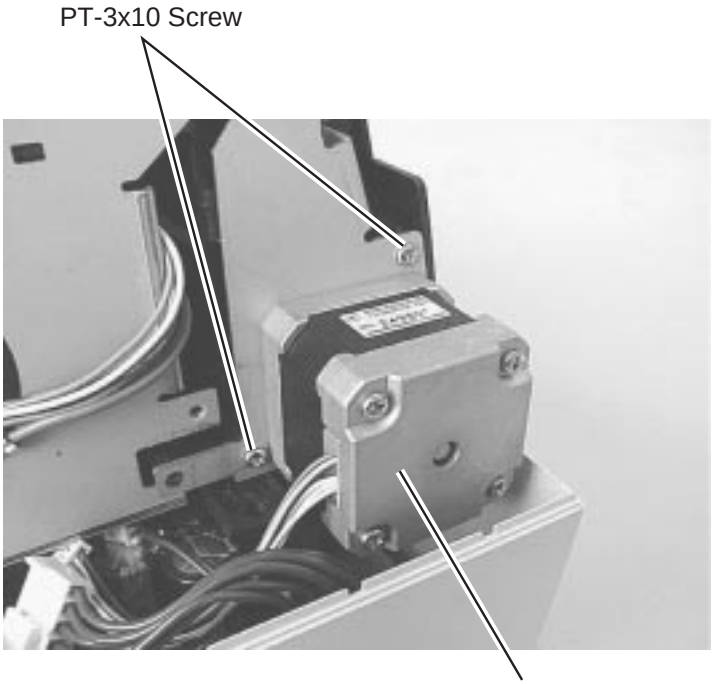


Fig. 2-6

2) Remove the two SMW-3x6 screws to detach the stepping motor.

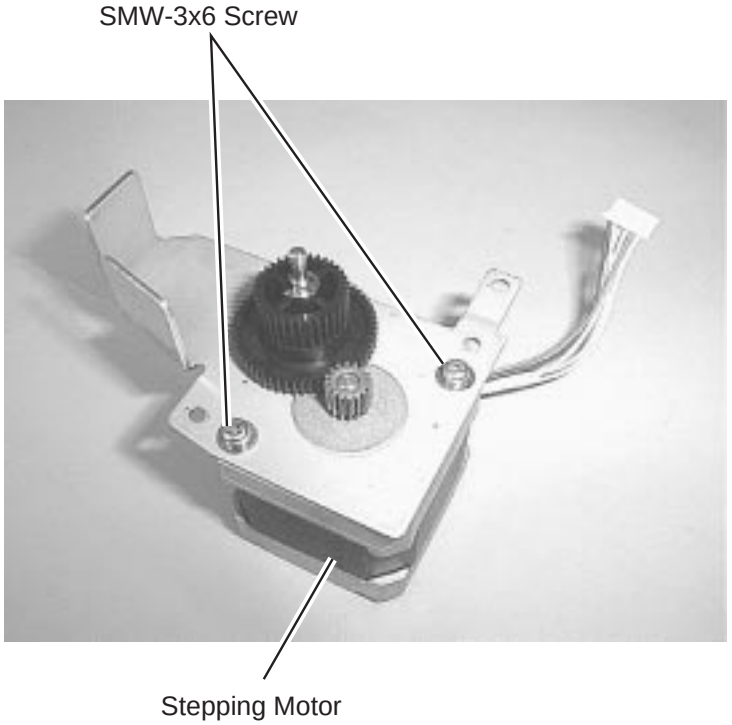


Fig. 2-7

3) Replace the stepping motor with a new one, and then reassemble in the reverse order of removal.

2.3 REPLACING THE PS UNIT

WARNING!
Replace only with the same type and rated of fuse for continued protection against risk of fire.

1) Refer to Section 2.1 to detach the top cover.
2) Remove the T-3x10 screw to detach the side cover R.

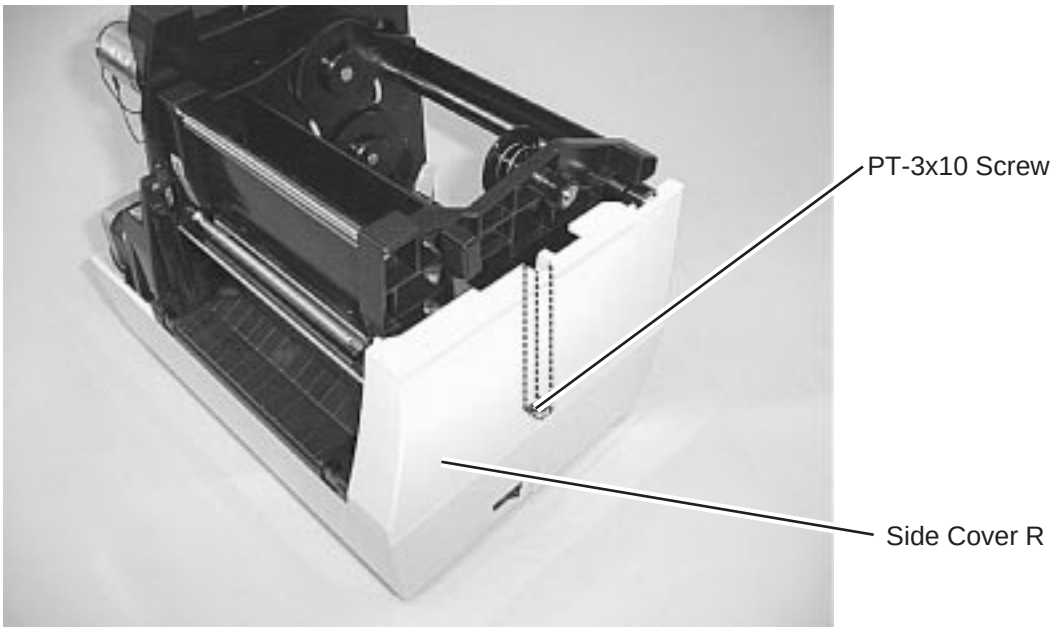


Fig. 2-8

3) Disconnect the power harness and fan motor harness from CN9 and CN8 on the CPU PC board.

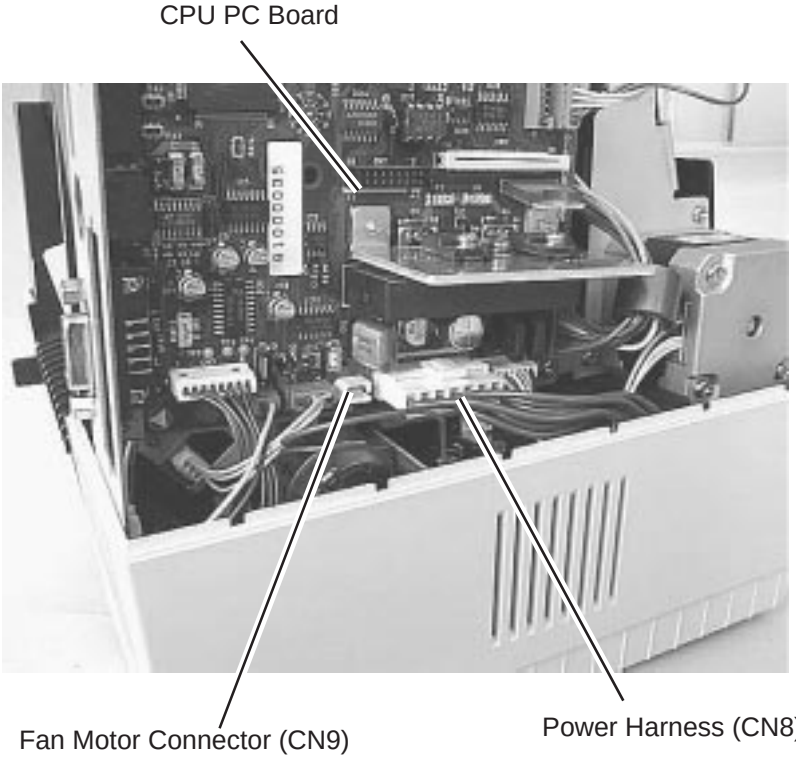


Fig. 2-9

4) Release the two hooks securing the printer unit.

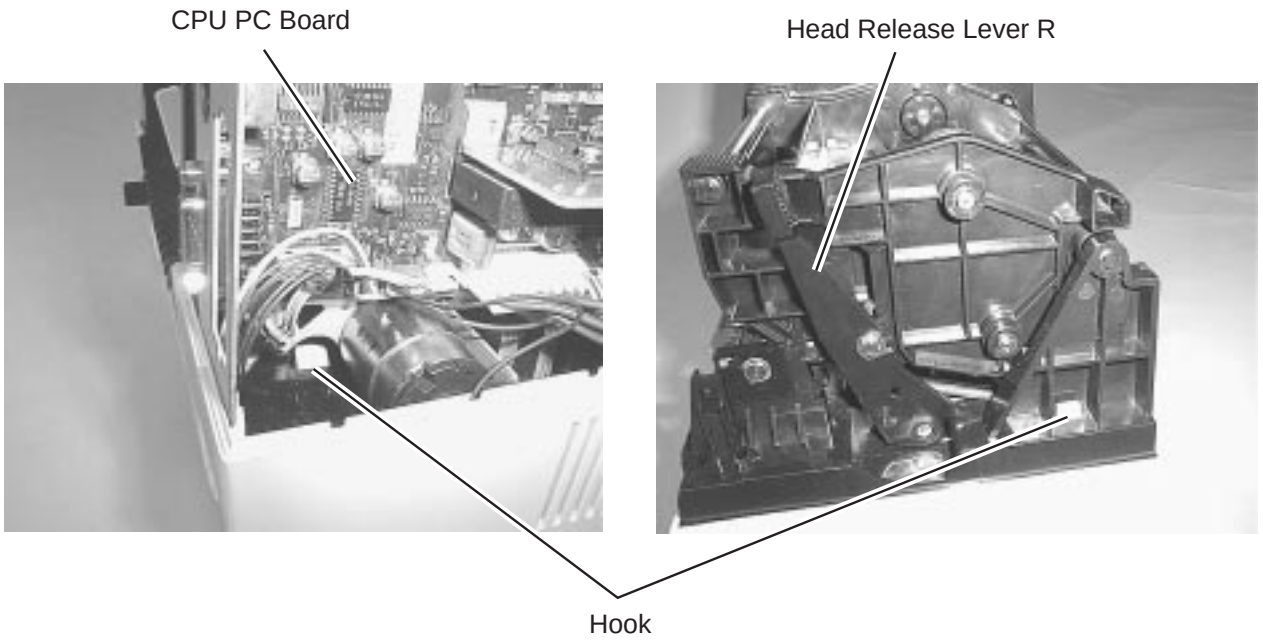


Fig. 2-10

5) Detach the printer unit from the bottom cover.

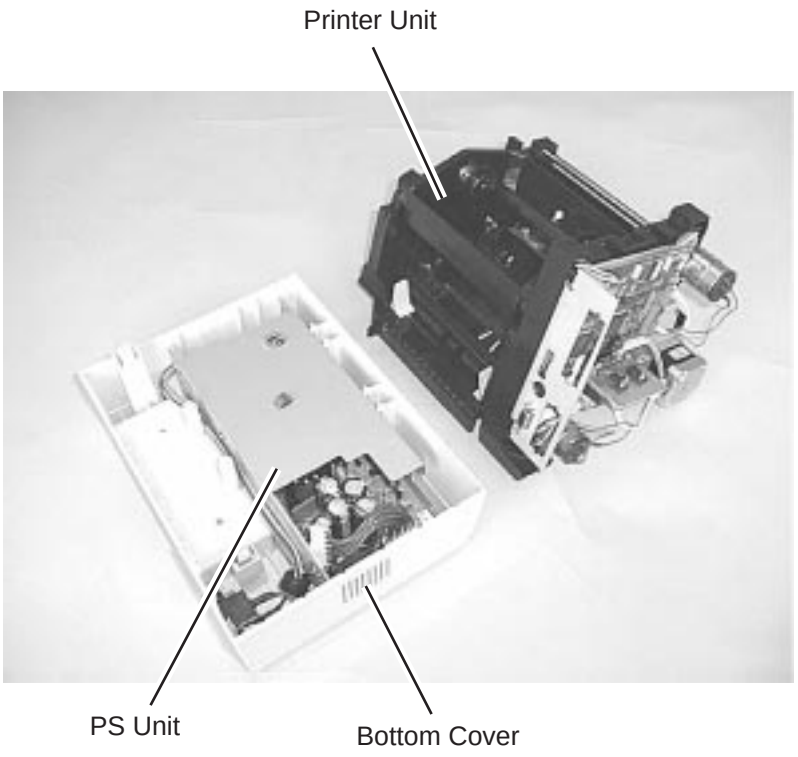


Fig. 2-11

6) Detach the PS unit from the bottom cover.

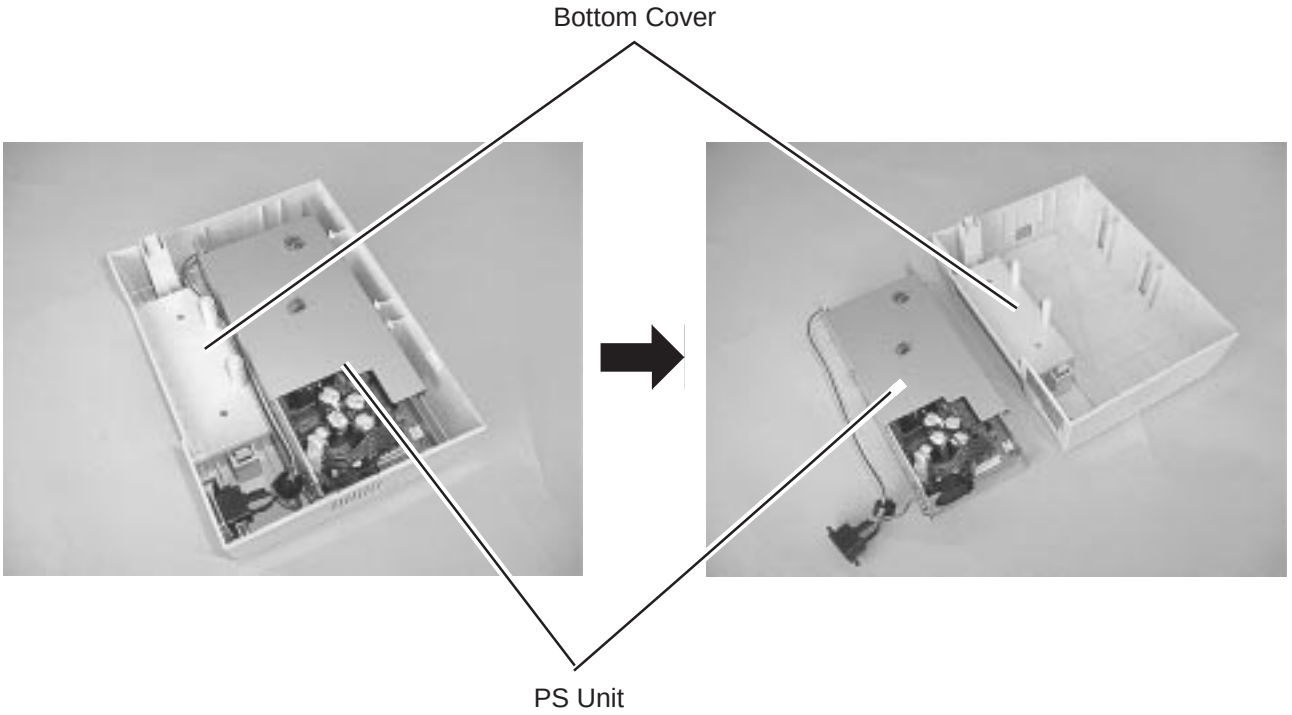


Fig. 2-12

7) Disconnect the power harness from CN3 on the PS unit. Remove the SMW-4x8 screw to release the ground wire of the inlet ass'y.

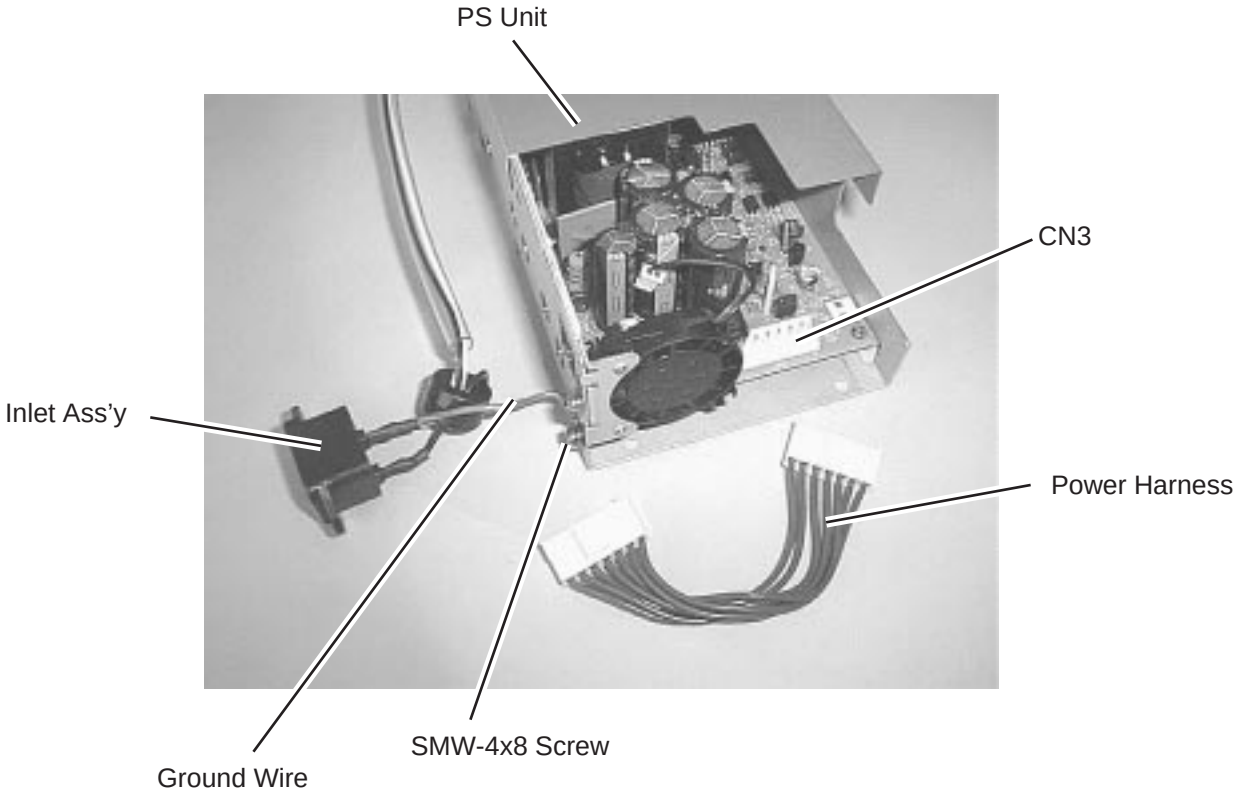


Fig. 2-13

8) Disconnect the inlet ass'y from CN1 on the PS unit.

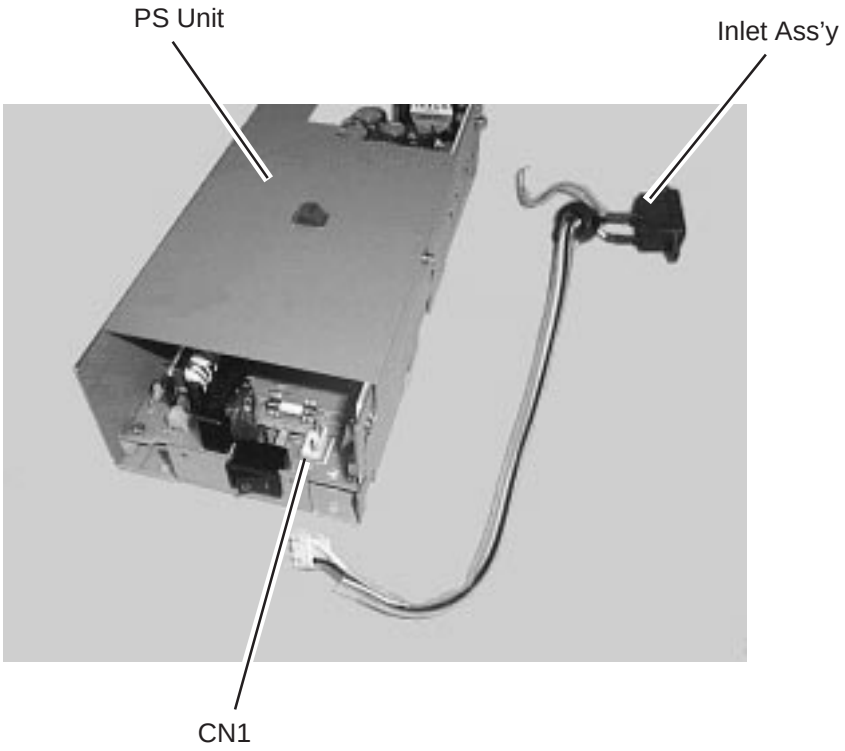


Fig. 2-14

9) Replace the PS unit with a new one, and then reassemble in the reverse order of removal.

2.4 REPLACING THE PRINT HEAD

CAUTION: *1. NEVER touch the element when handling the print head.*
2. NEVER touch the connector pins. Touching them may cause a static electric discharge which will damage the print head.

1) Push down the head release lever R to open the print head block.

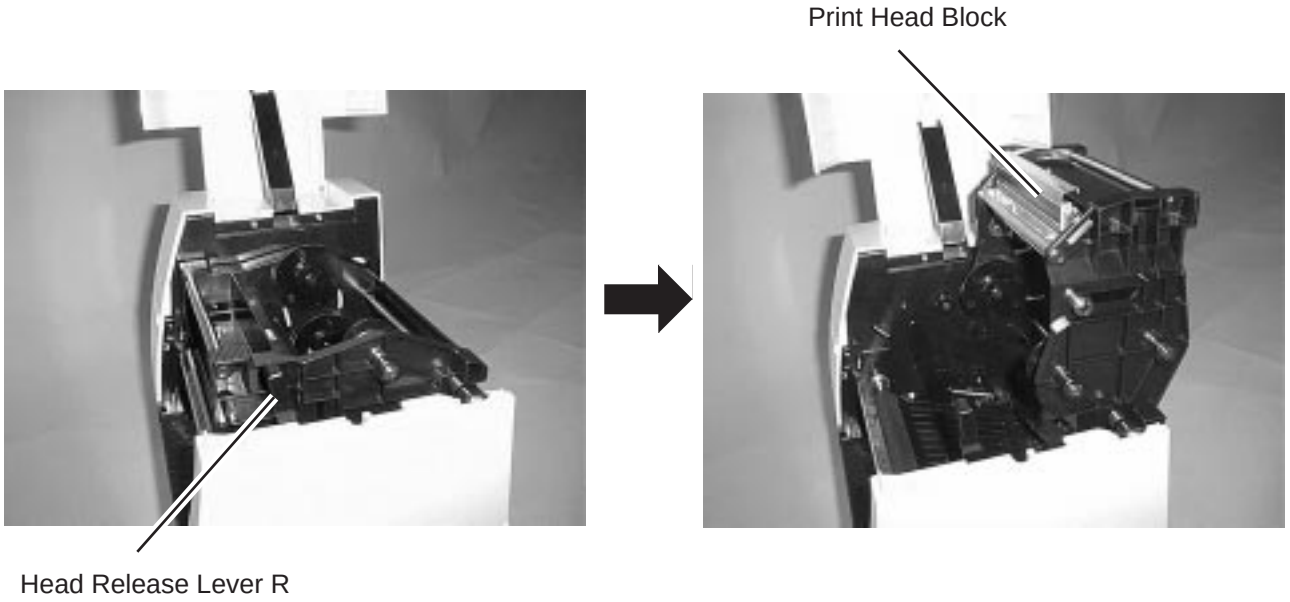


Fig. 2-15

2) Disconnect the two print head harnesses. Then, pull the print head ass'y upward while pulling the knob.

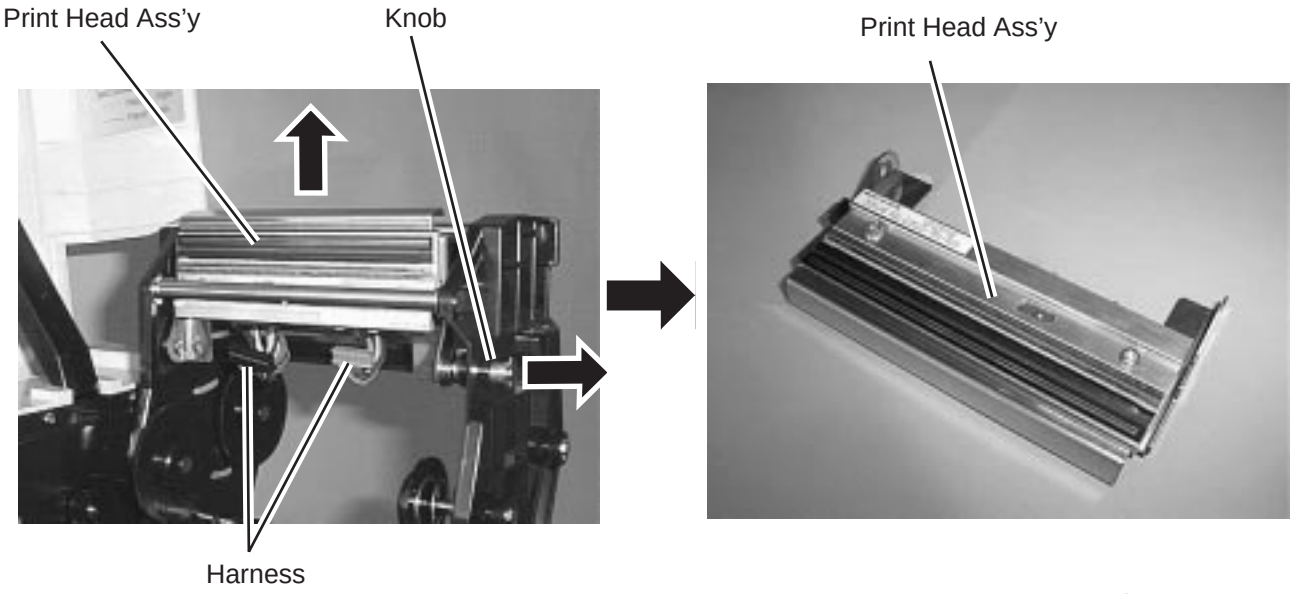


Fig. 2-16

3) Replace the print head with a new one, and then reassemble in the reverse order of removal.

2.5 REPLACING THE HEAD CONTROL PC BOARD (FOR THE B-452-HS MODEL)

1) Open the top cover. (Refer to Section 2.1.)
2) Remove the two PT-3x10 screws to detach the top cover. (Refer to Section 2.1.)
3) Disconnect the harness and flat cable from CN1 and CN2 on the head control PC board, respectively.
   NOTE: *When re-connecting the flat cable, be careful of the terminal orientation.*
4) Detach the head control PC board from the three locking supports that secure it to the CPU PC board.

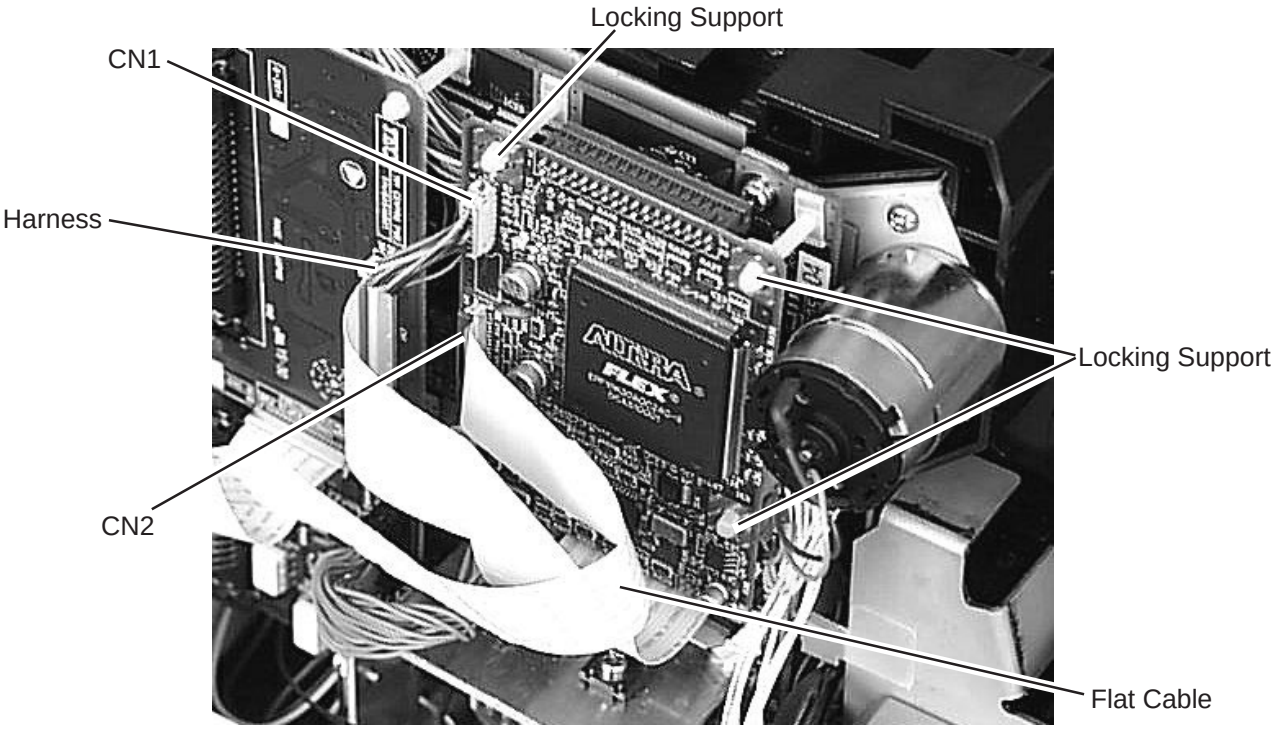


Fig. 2-17

5) Disconnect the harness from CN3 on the head control PC board.

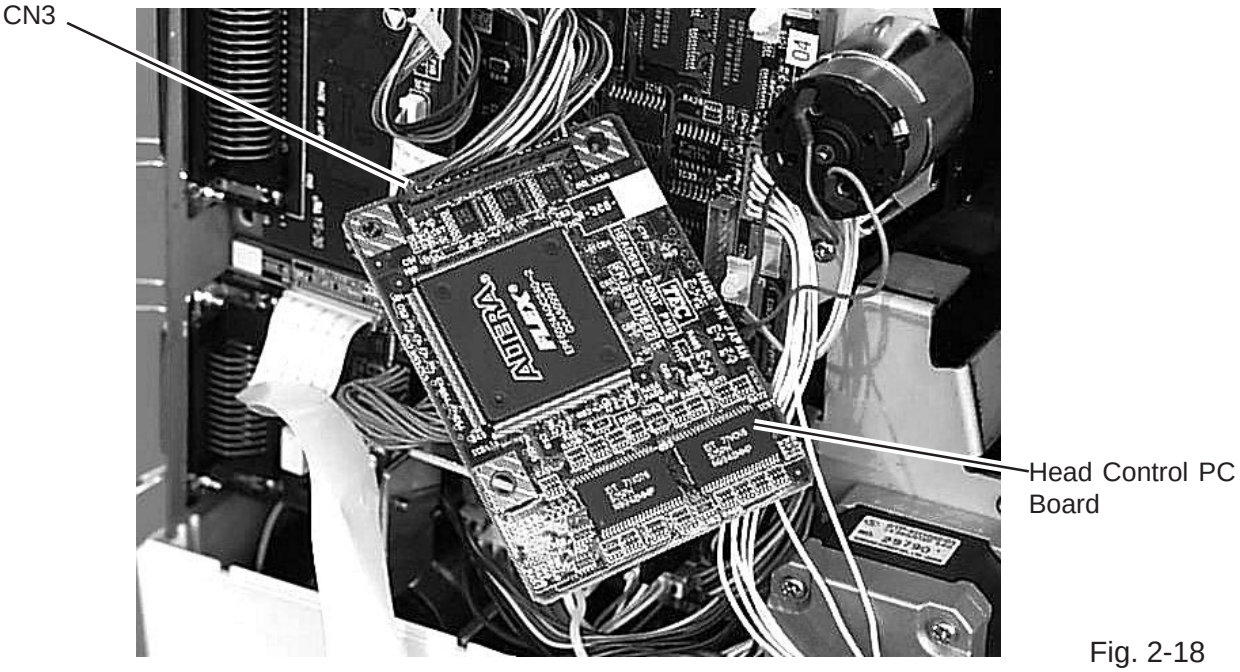


Fig. 2-18

6) Replace the head control PC board with a new one, and then reassemble in the reverse order of removal.

2.6 REPLACING THE MEDIA SENSOR

2.6.1 B-452-TS Model

Replacing the Sensor PCB (TR)

1) Push down the head release lever R to open the print head block. (Refer tp Sectopm 2.4.)
2) Remove the sensor holder from the sensor holder arm.

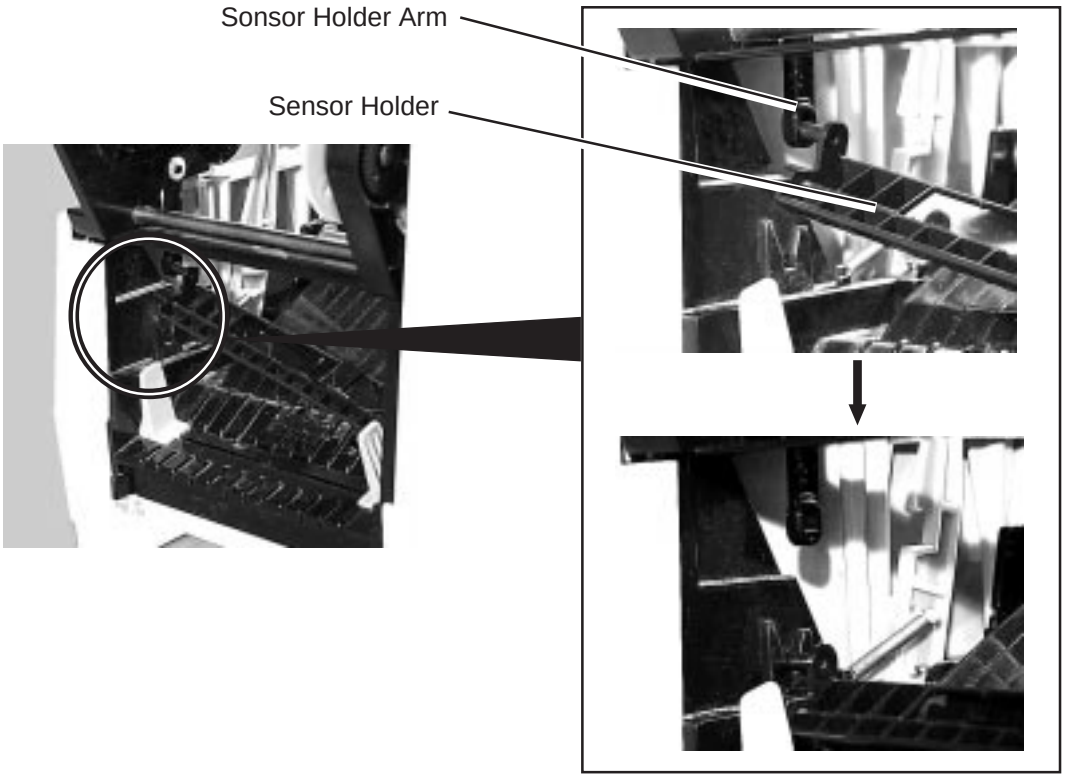


Fig. 2-19

3) Remove the sensor cover sheet from the sensor holder.

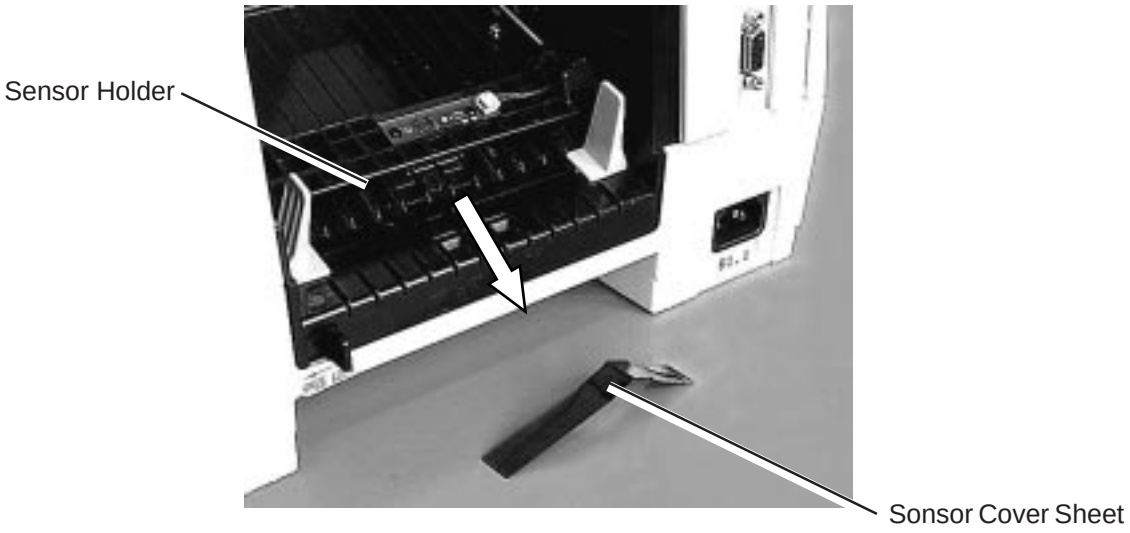


Fig. 2-20

4) Release the sensor holder while spreading the tabs of the sensor holder. Be careful not to break the tabs when spreading them.

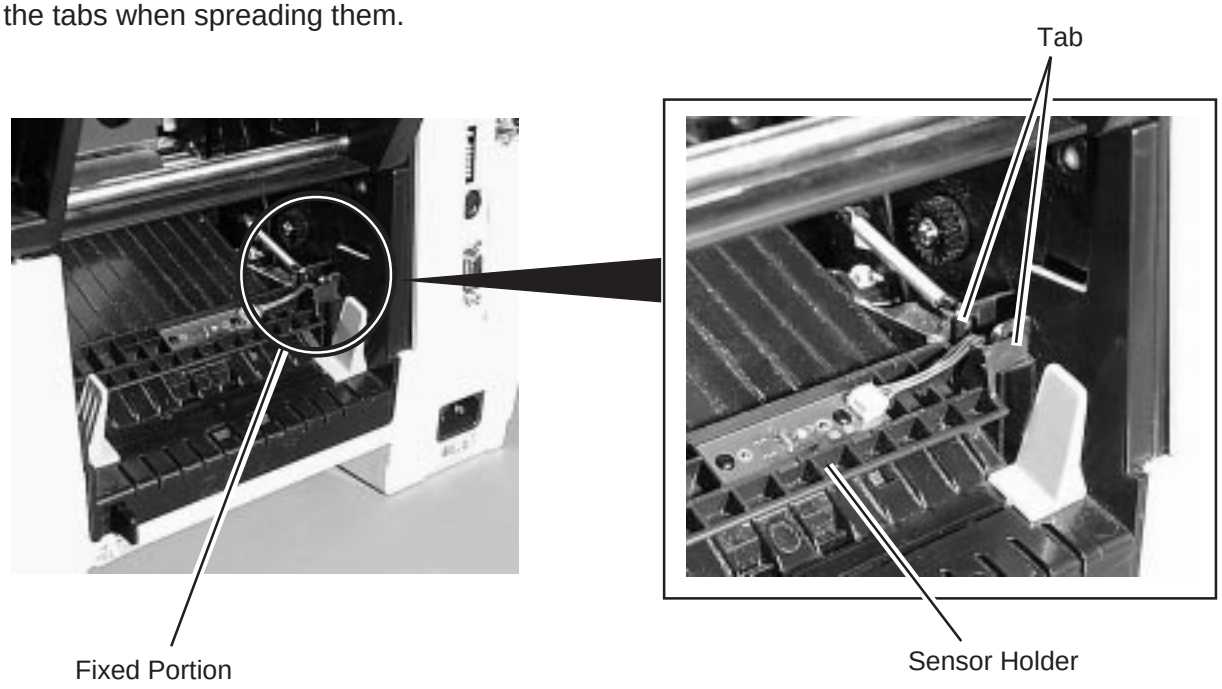


Fig. 2-21

5) Disconnect the harness from the sensor PCB (TR), and remove the sensor PCB (TR) from the sensor holder by releasing it from the two rivets.

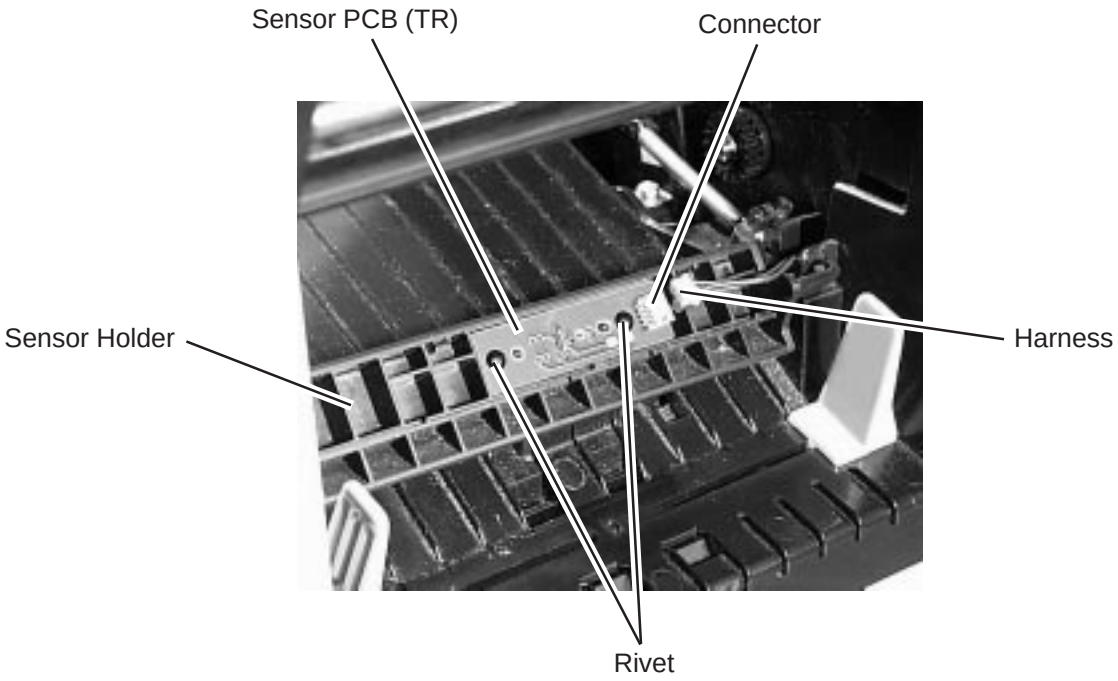


Fig. 2-22

6) Replace the sensor PCB (TR) with a new one, and then reassemble in the reverse order of removal.
7) After replacement, refer to Section 6.7 THRESHOLD SETTING in this manual to make a sensor adjustment.

Replacing the Sensor PCB (LED)

1) Open the top cover. (Refer to Section 2.1)
2) Remove the top cover. (Refer to Section 2.1.)
3) Push down the head release lever R to open the print head block. (Refer to Section 2.4.)
4) Detach the printer unit from the bottom cover. (Refer to Section 2.3.)
5) Disconnect the harness from the sensor PCB (LED) which is attached to the bottom of the printer unit. Then remove the rivet to detach the sensor PCB from the printer unit.

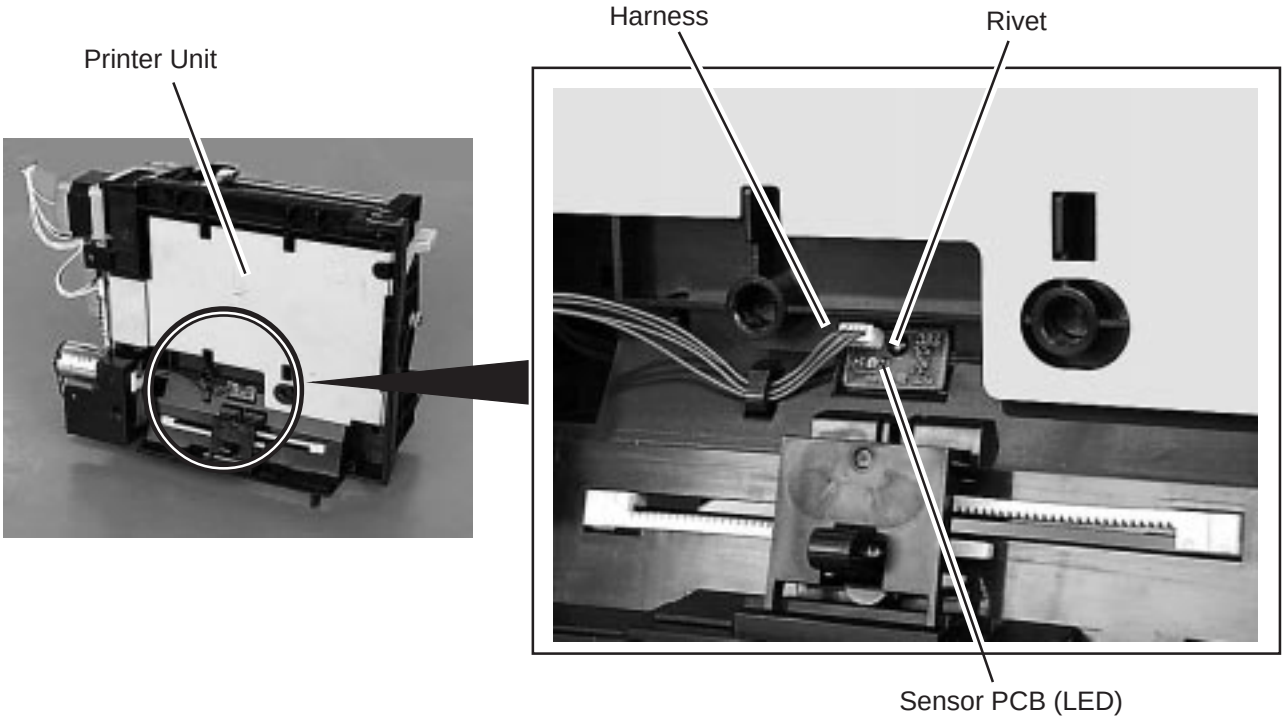


Fig. 2-23

6) Replace the sensor PCB (LED) with a new one, and then reassemble in the reverse order of removal.
7) After replacement, refer to Section 6.7 THRESHOLD SETTING in this manual to make a sensor adjustment.

2.6.2 B-452-HS Model

Replacing the Sensor PCB (TR)

1) Push down the head release lever R to open the print head block. (Refer to Section 2.4.)
2) Set the sensor knob to position 5 and lift the sensor holder.
3) Push out the rivet from the back side of the sensor holder and release the sensor PCB cover from the sensor holder.

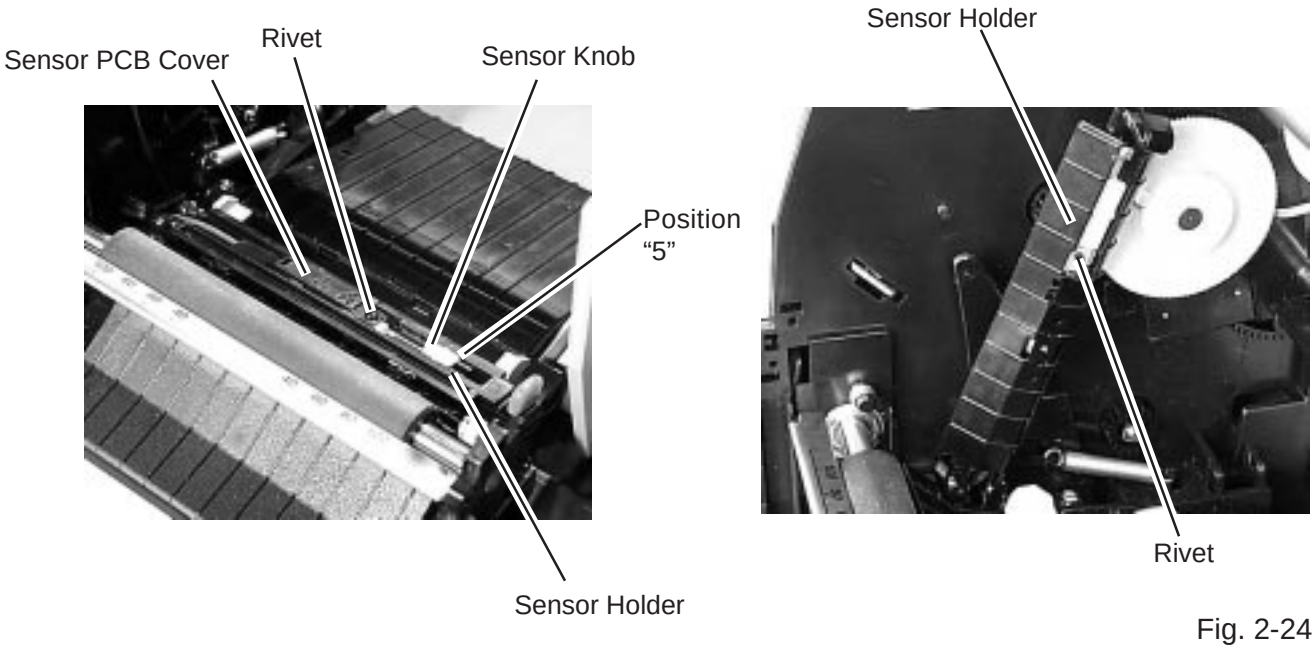


Fig. 2-24

4) Slide the sensor PCB (TR) to the left side to release it from the sensor holder, and disconnect the harness from the sensor PCB (TR).

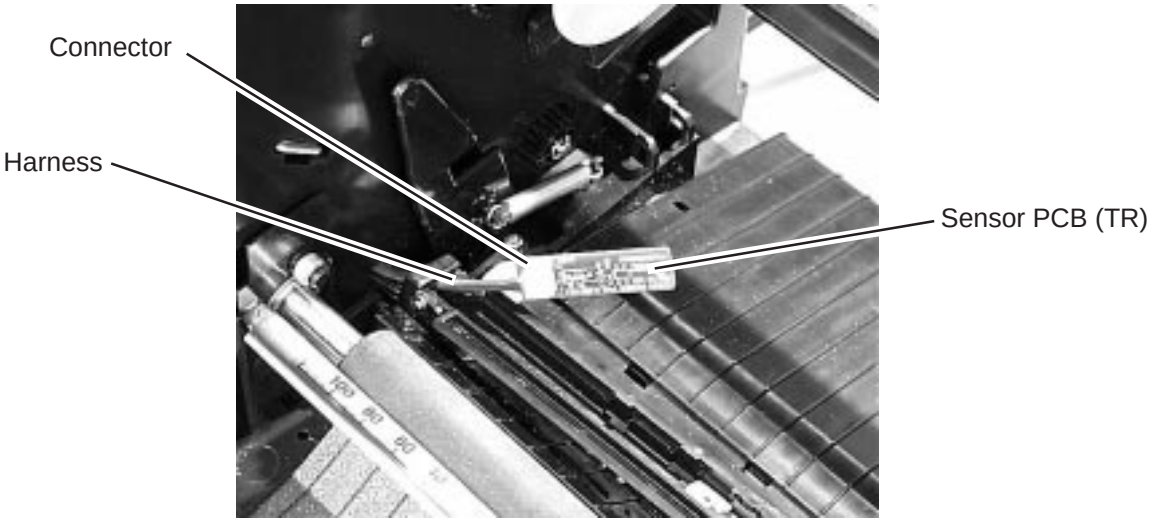


Fig. 2-25

5) Replace the sensor PCB (TR) with a new one, and then reassemble in the reverse order of removal.
   NOTE: Secure the sensor PCB (TR) with the rivet together with the sensor PCB cover and slide button top.
6) After replacement, refer to Section 6.7 THRESHOLD SETTING in this manual to make a sensor adjustment.

Replacing the Sensor PCB (LED)

1) Push down the head release lever R to open the print head block. (Refer to Section 2.4.)
2) Push the sensor release lever to the direction indicated by the arrow and lift the sensor block.

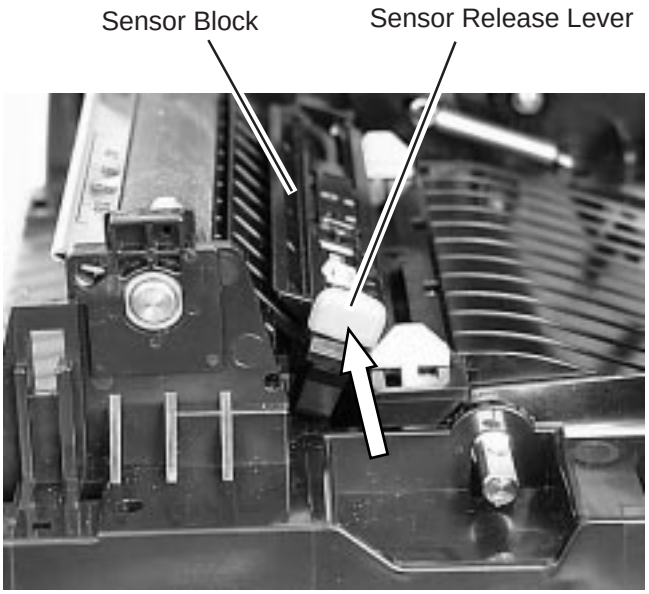


Fig. 2-26

NOTE: In the above picture, the head release lever R is removed to indicate the position of the sensor release lever clearly. In the actual procedure, the head release lever R does not have to be removed.

3) Set the media sensor knob to position 5.
4) Lift the sensor block by the tab.

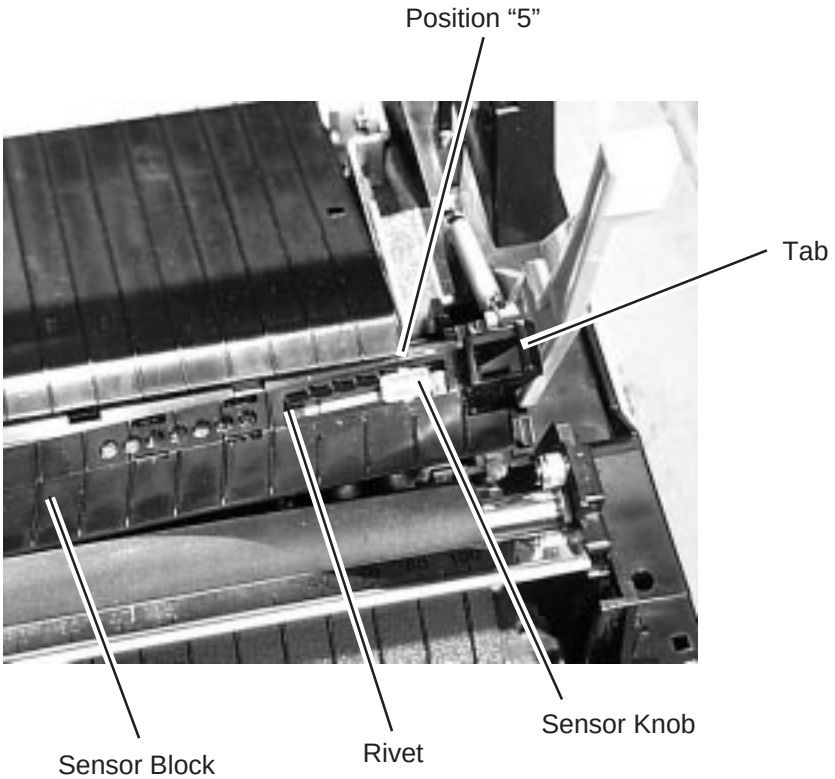


Fig. 2-27

5) Push out the rivet which secures the sensor PCB (LED) from the back side of the sensor block.
6) Disconnect the harness from the sensor PCB (LED) and remove the sensor PCB (LED) from the sensor block.

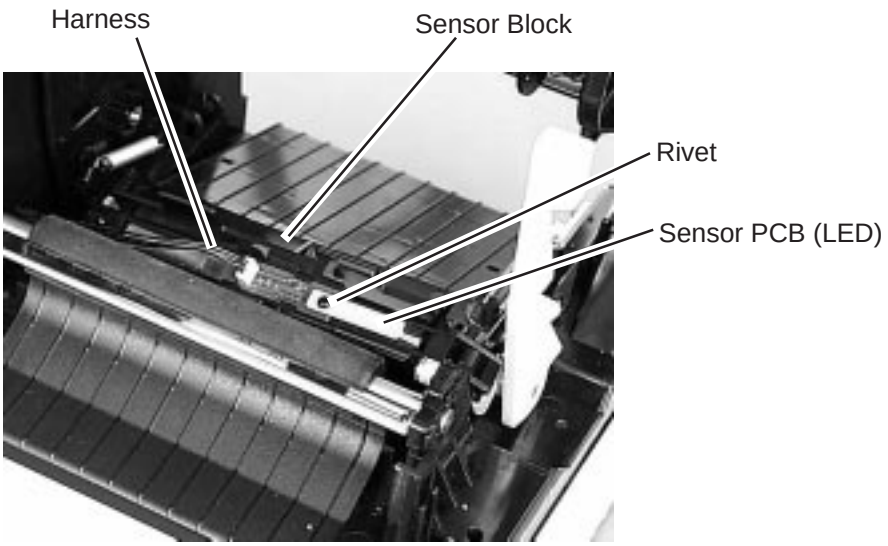


Fig. 2-28

7) Replace the sensor PCB (LED) with a new one, and then reassemble in the reverse order of removal.
   NOTE: Secure the sensor PCB (LED) with the rivet together with the slide button bottom.
8) After replacement, refer to Section 6.7 THRESHOLD SETTING in this manual to make a sensor adjustment.

2.7 REPLACING THE 600 DPI EXPIO PC BOARD (FOR B-452-HS MODEL)

1) Open the top cover. (Refer to Section 2.1.)
2) Remove the top cover. (Refer to Section 2.1.)
3) Disconnect the harness and flat cable from CN1 and CN3 on the 600 DPI EXPIO PC board, respectively.

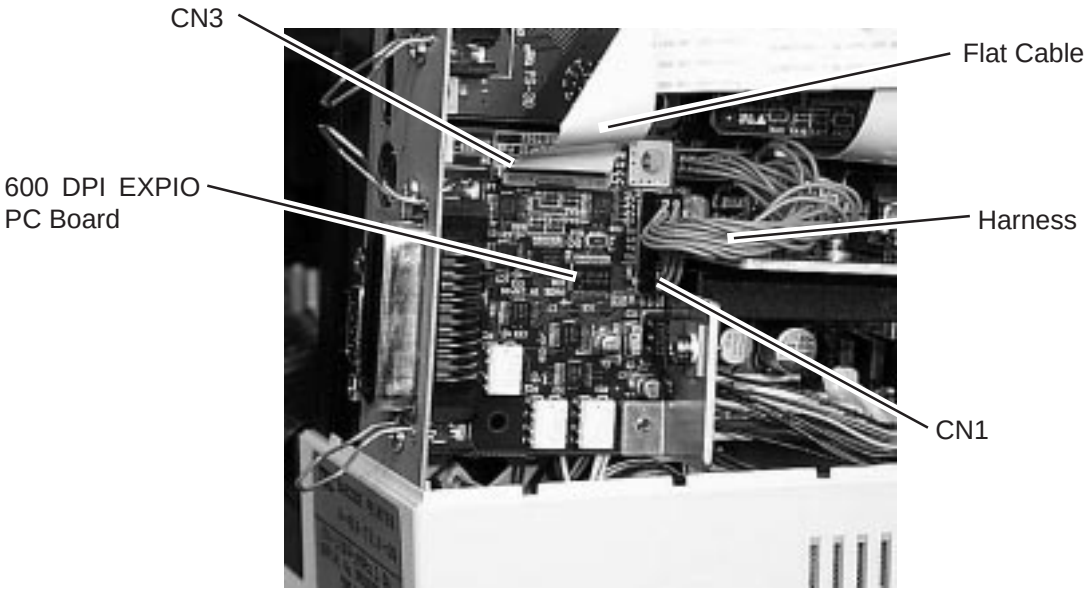


Fig. 2-29

4) Remove the two B-3x6 screws and detach the 600 DPI EXPIO PC board from the locking support that secures it to the CPU PC board.

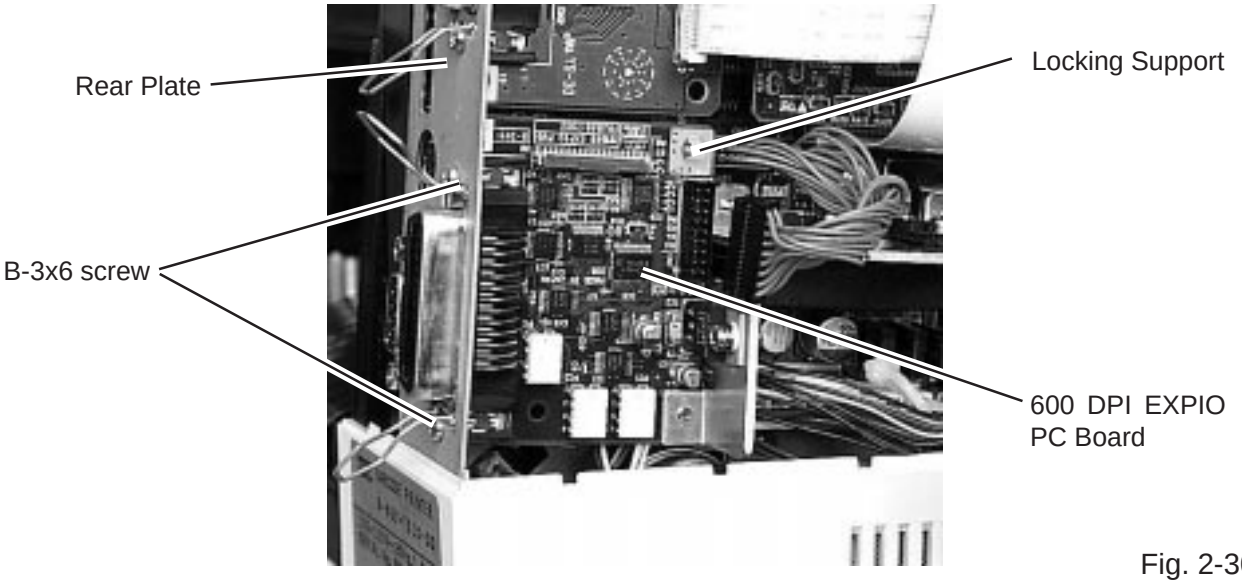


Fig. 2-30

5) Replace the 600 DPI EXPIO PC board with a new one, and then reassemble in the reverse order of removal.

3. INSTALLATION PROCEDURE FOR THE OPTIONAL EQUIPMENT

3.1 CUTTER MODULE (B-7204-QM)

WARNING!

1. Disconnect the power cord before installing the cutter module.
2. Be careful not to injure your fingers when installing the cutter module.

3.1.1 Packing List

All the following parts are supplied with the kit. Make sure you have all items shown below.

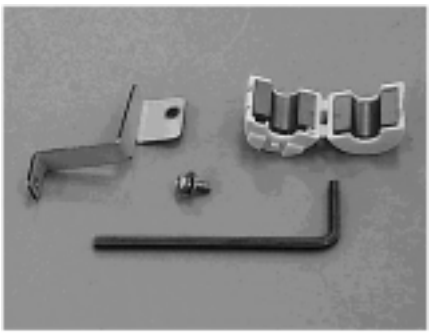
Cutter Unit (1 pc.)	Cutter Harness (1 pc.)	Double Sems Screw SMW-3x8 (1 pc.) Cutter Ground Plate B (1 pc.) Ferrite Core (1 pc.) Allen Key (1 pc.) 
Cutter Cover (1 pc.)	Installation Manual (1 pc.)	

Fig. 3-1

3.1.2 Installation Procedure

1) Turn the power off.
2) Open the top cover and remove the two PT-3x10 screws.

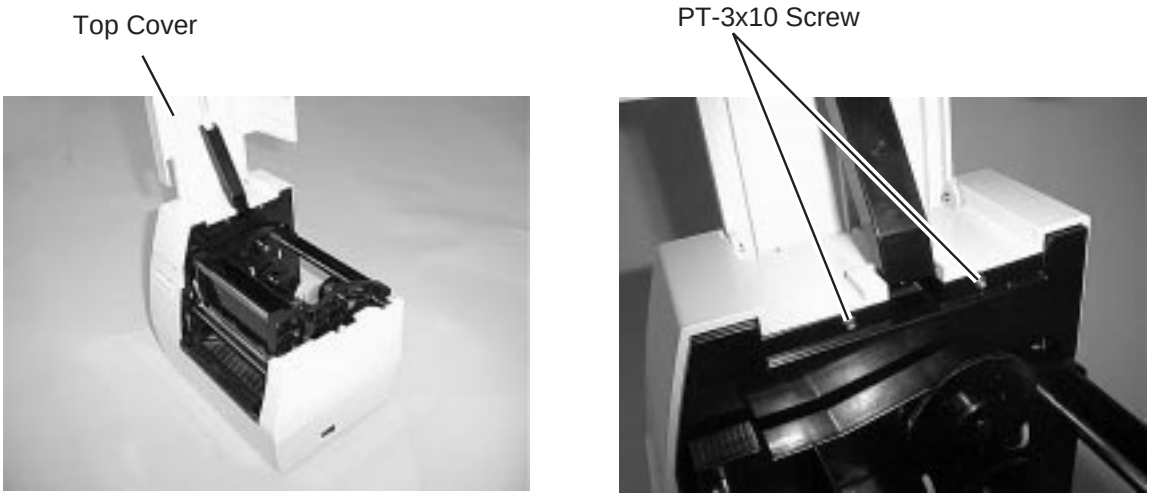


Fig. 3-2

3) Disconnect the KEY LED harness from CN14 on the CPU PC board and detach the side cover L.

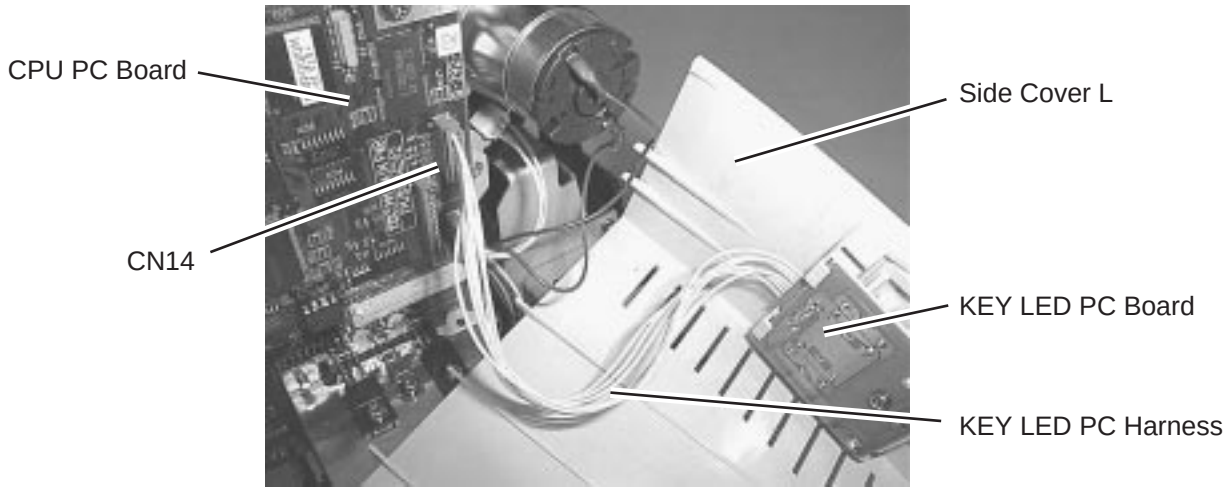


Fig. 3-3

4) Move the head release lever toward the front of the printer to open the print head block.

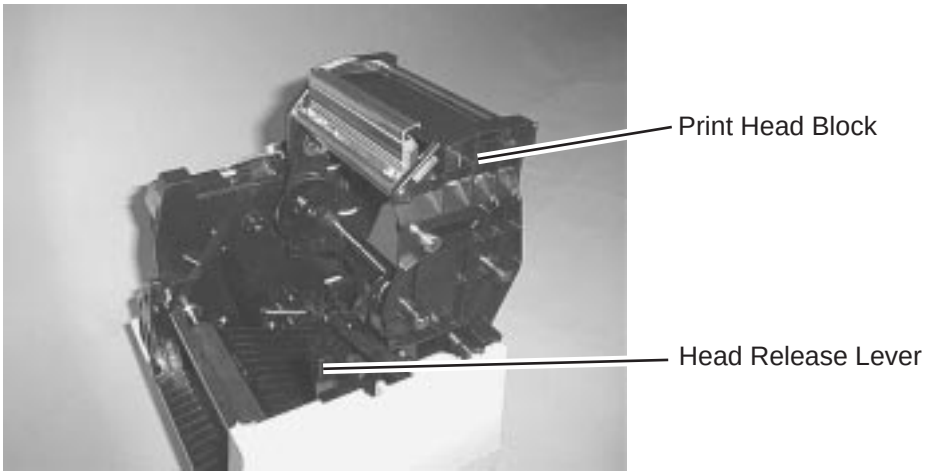


Fig. 3-4

5) Unhook and remove the platen block from the printer.

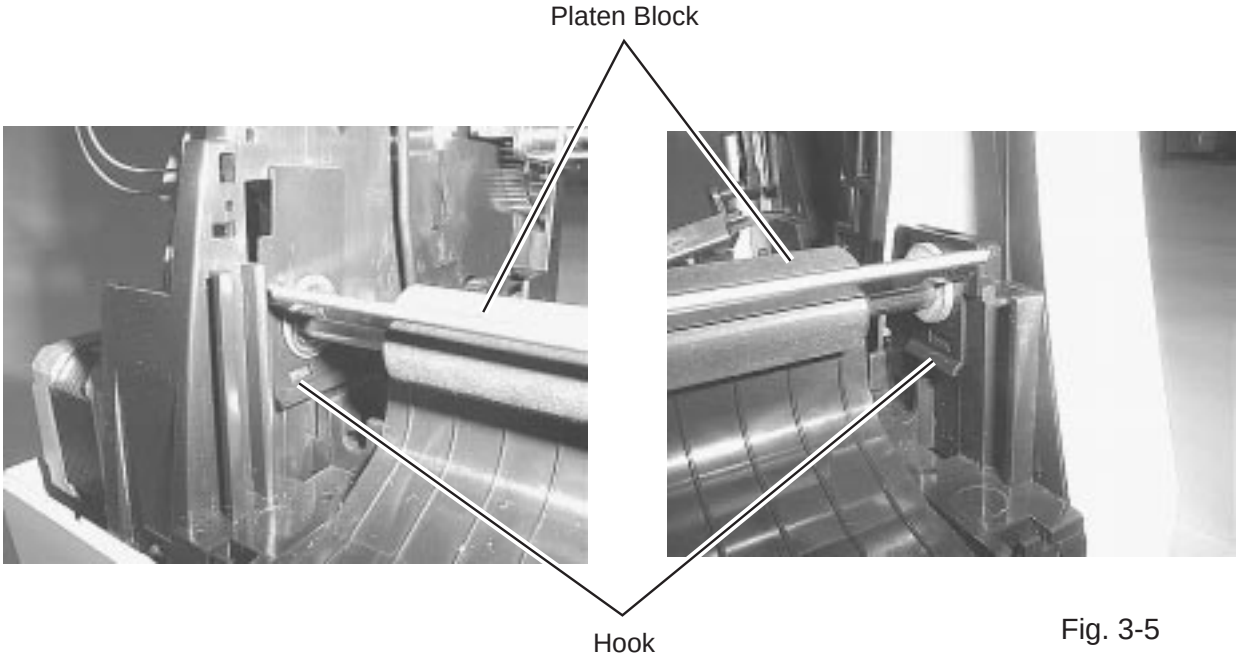


Fig. 3-5

6) Remove the paper scale from the platen block.

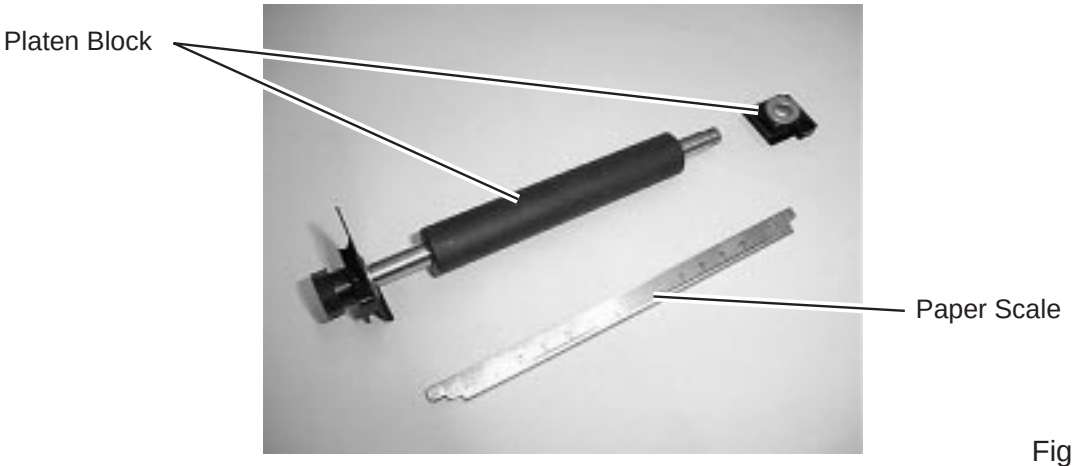


Fig. 3-6

NOTE: *Store the removed paper scale in a safe place so that it may be replaced should the cutter module be removed in the future.*

7) Replace the platen block.

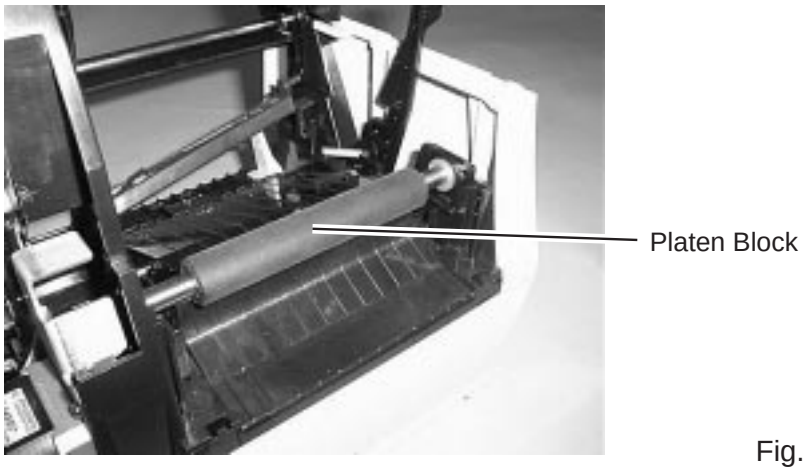


Fig. 3-7

8) Remove the PT-3x10 screw which secures the stepping motor ass'y. Secure the cutter ground plate B together with the stepping motor ass'y with the same screw.

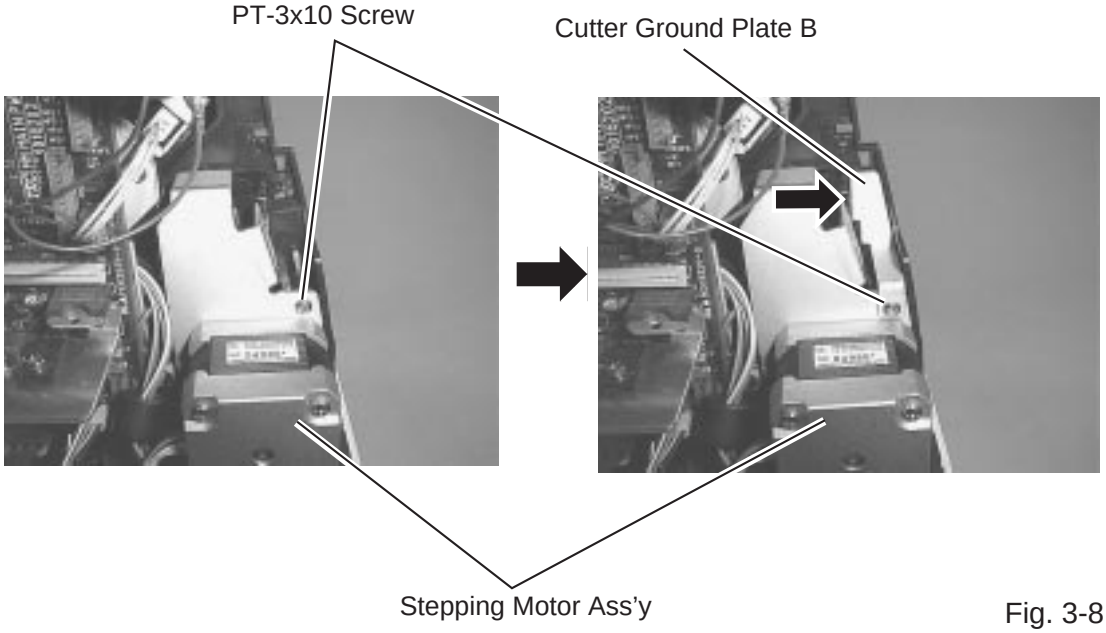


Fig. 3-8

9) Remove the cutter cover from the cutter unit by pressing the tab.

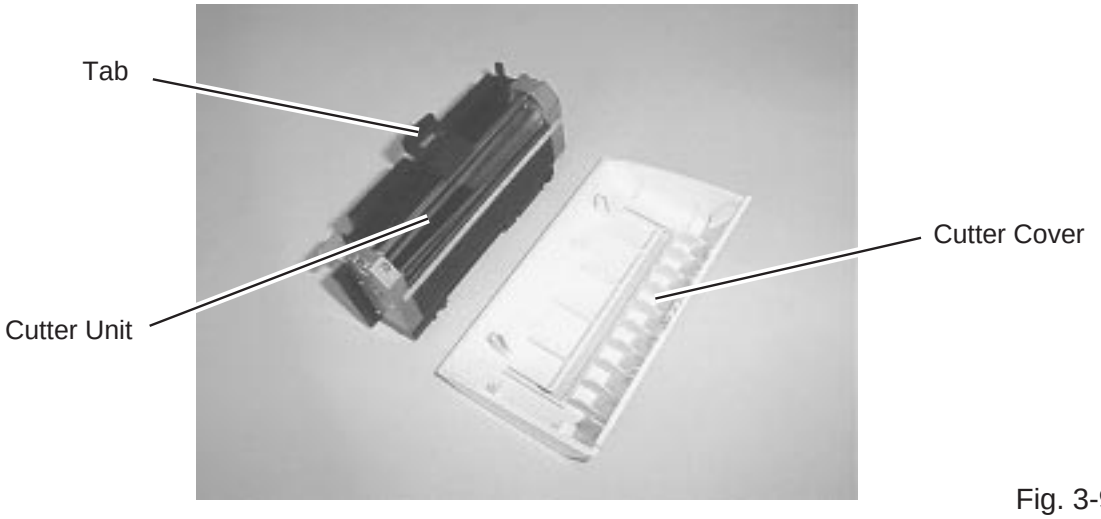


Fig. 3-9

10) Pass the cutter harness through the square hole indicated in the following picture so that the 13-pin connector comes to the CPU PC board side.

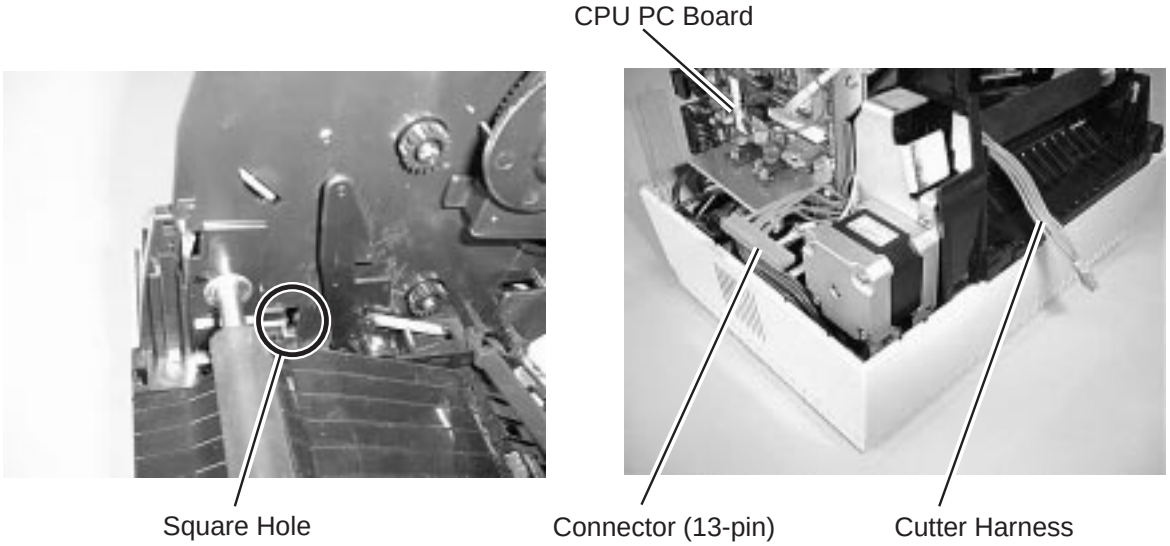


Fig. 3-10

11) Wind the cutter harness around the ferrite core one time, and connect it to CN22 on the CPU PC board.

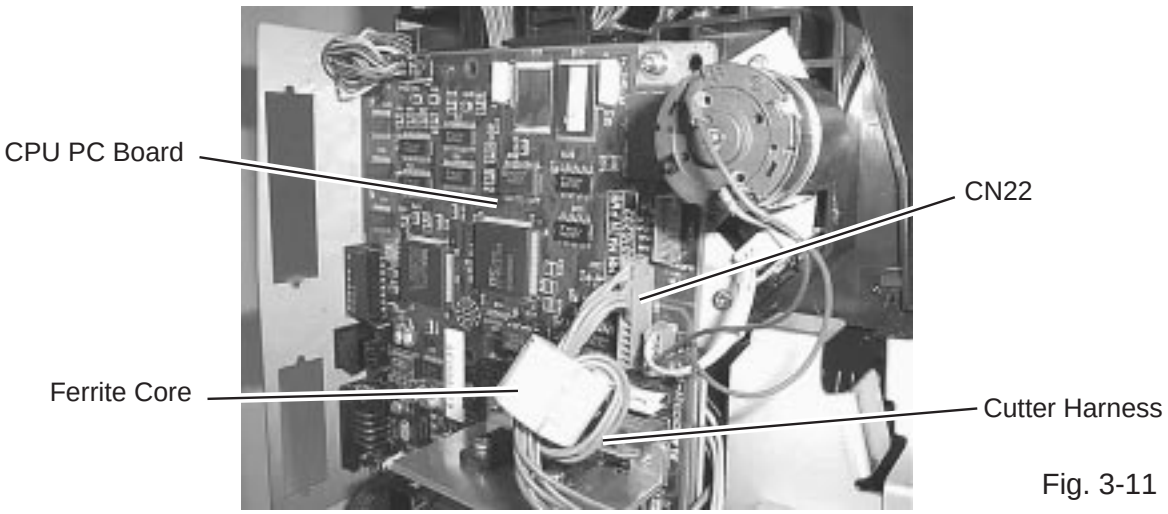


Fig. 3-11

12) Pass the cutter harness under the platen and connect it to the cutter unit.

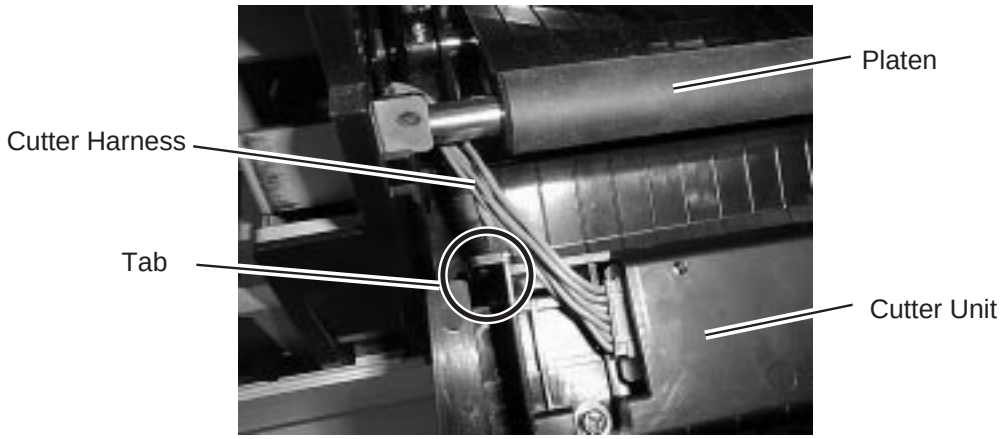


Fig. 3-12

NOTE: *Be careful not to pinch the cutter harness by the tab of the cutter unit (enclosed portion) when installing the cutter unit.*

13) Insert both sides of protruding portions of the cutter unit into the slits in front of the printer.

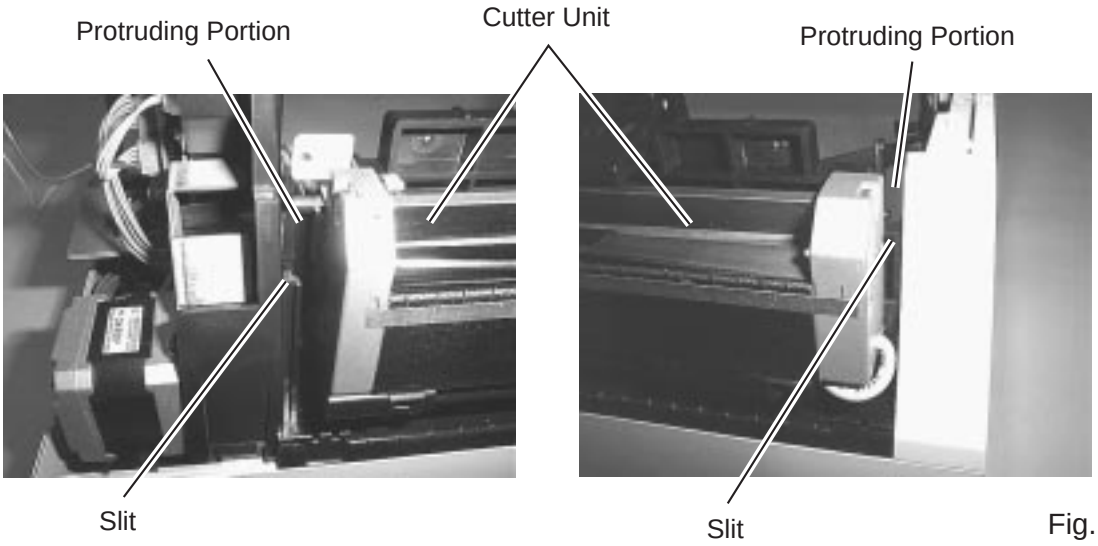


Fig. 3-13

14) Secure the cutter unit to the printer with the enclosed SMW-3x8 screw.

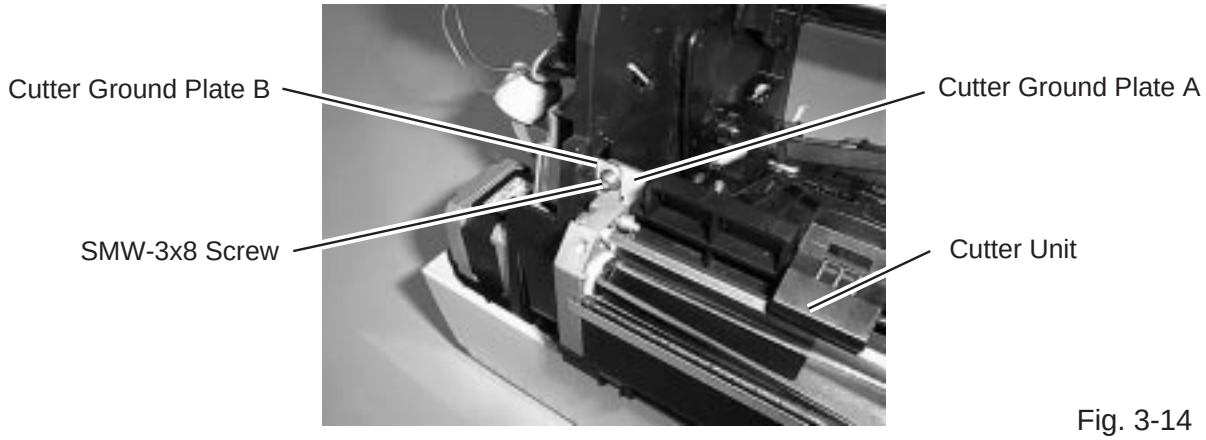


Fig. 3-14

NOTE: *Install the cutter unit so that the cutter ground plate A is positioned behind the cutter ground plate B.*

15) Fit the tabs on the reverse side of the cutter cover into the notches of the cutter unit to attach the cutter cover.

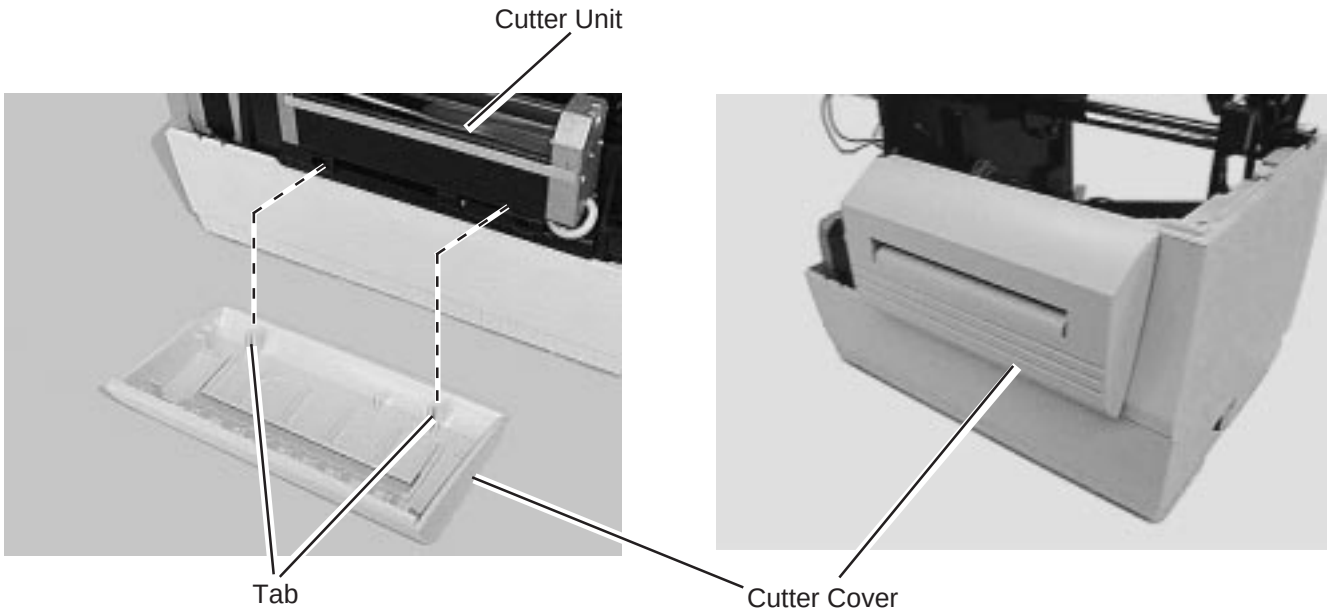


Fig. 3-15

16) Reassemble the top cover, side cover R and side cover L in the reverse order of removal.
NOTE: *Be careful not to pinch the harnesses by the covers when installing the cutter module.*

3.2 CENTRONICS INTERFACE BOARD (B-7704-C-QM)

3.2.1 Packing List

All the following parts are supplied with the kit. Make sure you have all items shown below.

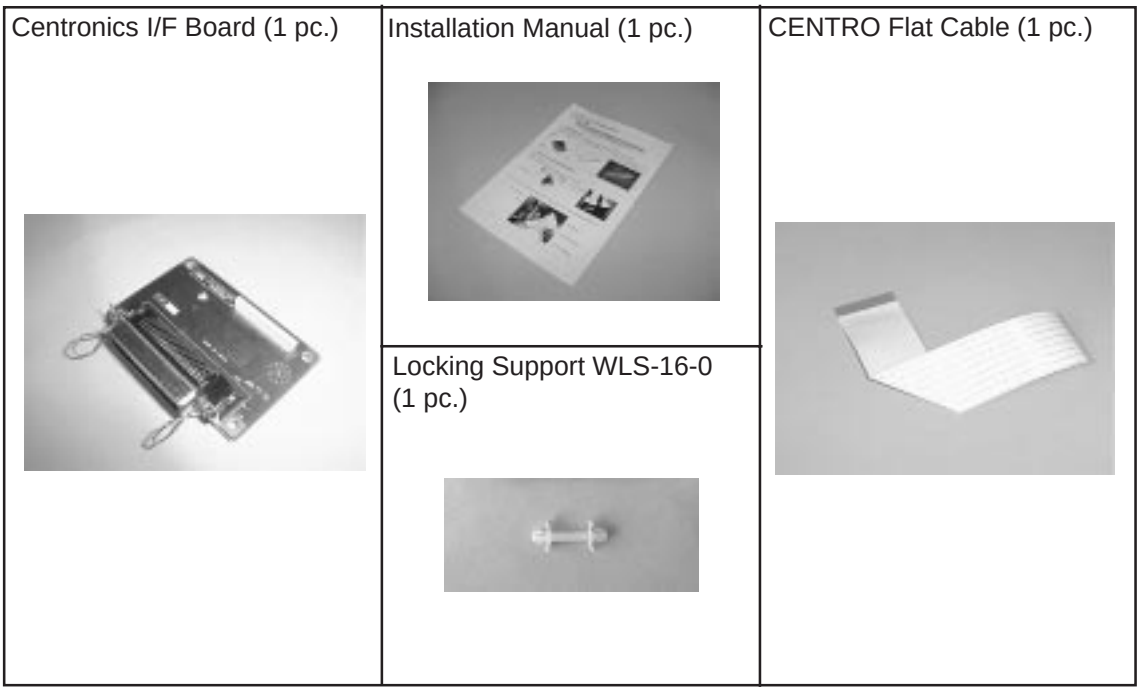


Fig. 3-16

3.2.2 Installation Procedure

1) Turn the power off.
2) Open the top cover and remove the two PT-3x10 screws. (Refer to section 3.1.)
3) Disconnect the KEY LED Harness from CN14 on the CPU PC board and detach the side cover L. (Refer to section 3.1.)
4) Remove the blind plate from the rear of the side cover L. (For QQ model.)

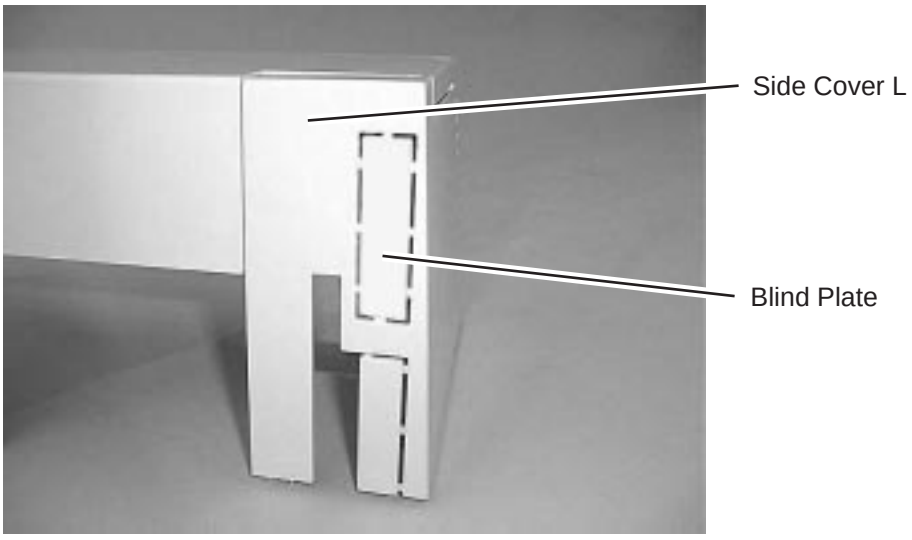


Fig. 3-17

5) Fit the enclosed locking support into the Centronics I/F board.
6) Secure the Centronics I/F board to the CPU PC board with the two B-3x6 screws and locking support as follows.

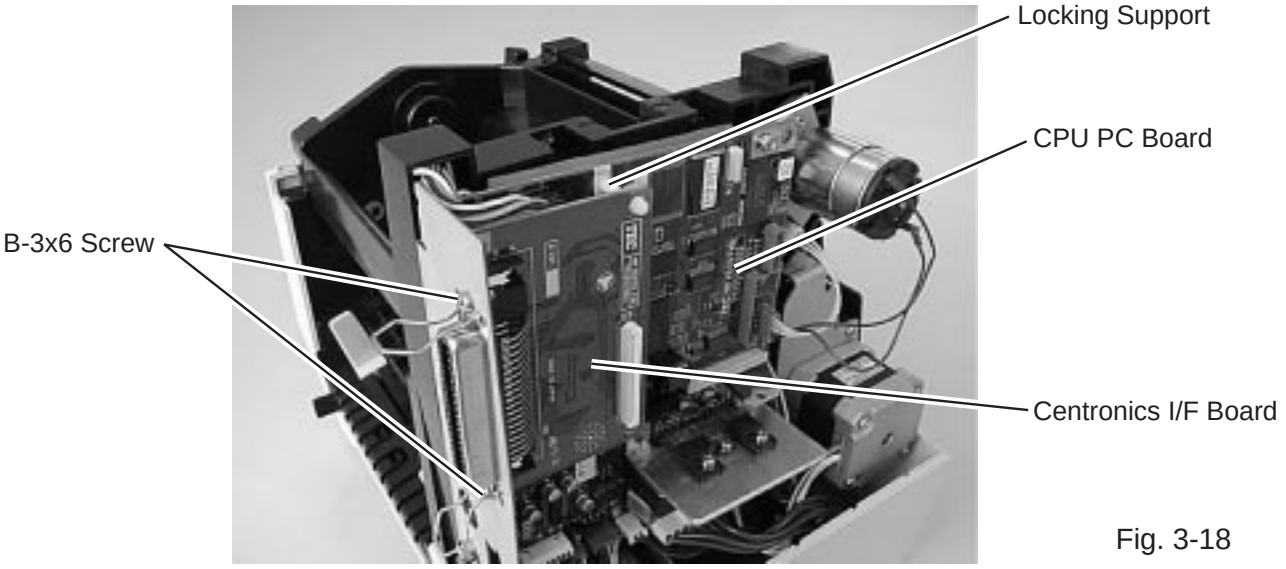


Fig. 3-18

7) Connect CN1 on the Centronics I/F board to CN11 on the CPU PC board with the CENTRO flat cable.

Fig. 3-19

8) Reassemble the top cover, and side cover L in the reverse order of removal.

NOTES: *1. Be careful not to pinch the harnesses by the covers when installing the Centronics I/F board.*
2. The Centronics interface board is installed in the B-452-HS model as standard.

3.3 EXPANSION I/O INTERFACE BOARD (B-7704-IO-QM)

3.3.1 Packing List

All the following parts are supplied with the kit. Make sure you have all items shown below

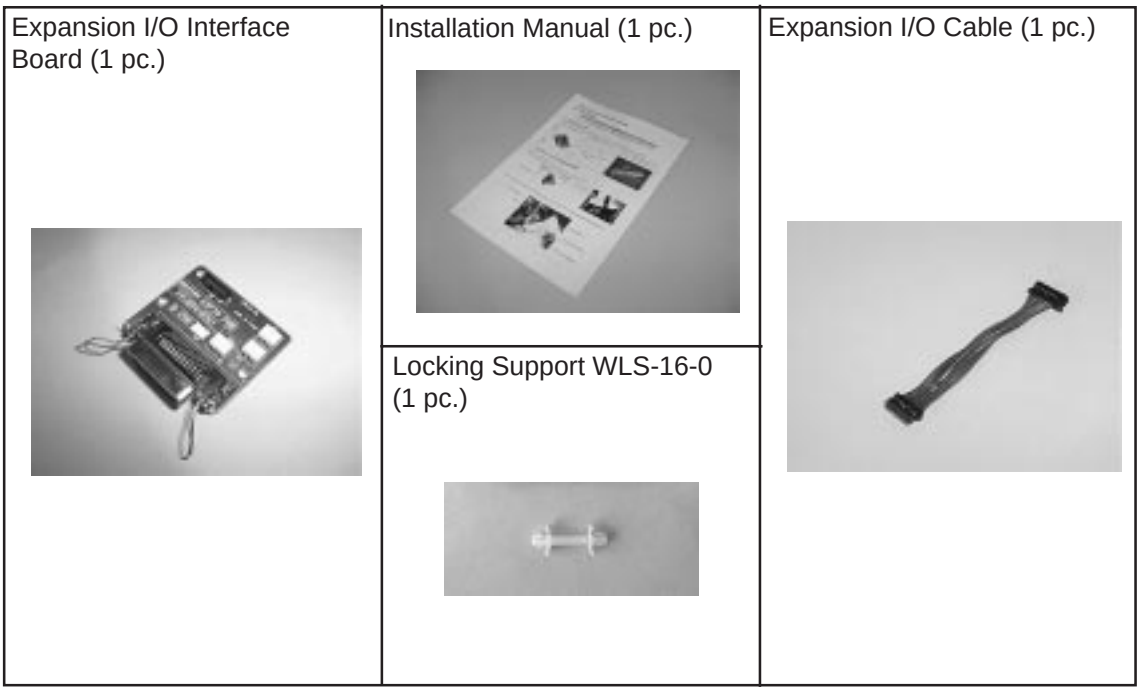


Fig. 3-20

3.3.2 Installation Procedure

1) Turn the power off.
2) Open the top cover and remove the two PT-3x10 screws. (Refer to section 3.1.)
3) Disconnect the KEY LED harness from CN14 on the CPU PC board to detach the side cover L. (Refer to section 3.1)
4) Remove the blind plate from the rear of the side cover L.

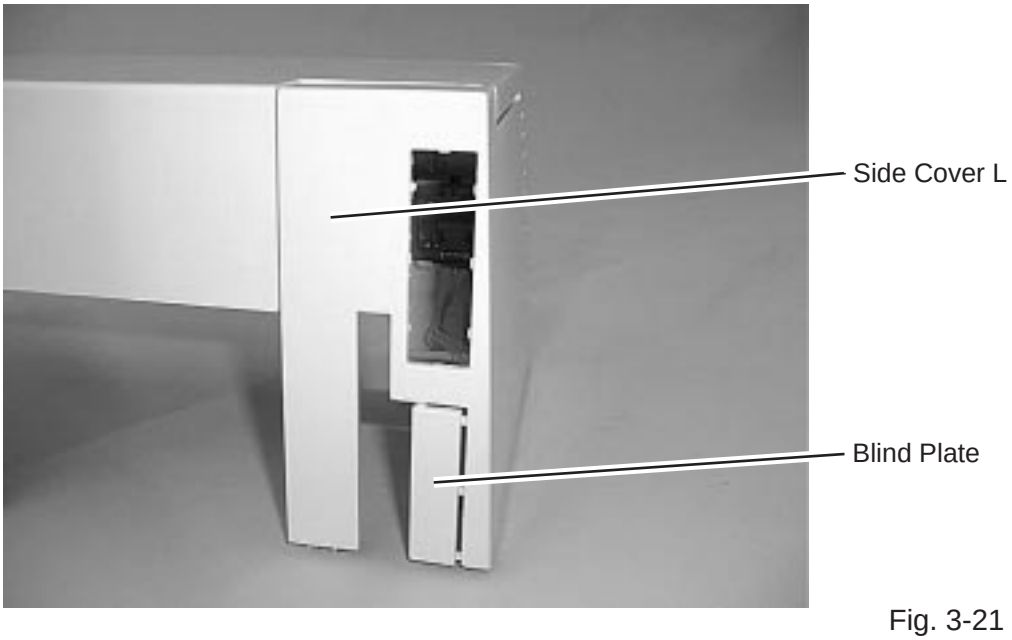


Fig. 3-21

5) Secure the expansion I/O interface board to the CPU PC board with the enclosed two B-3x6 screws and the locking support as follows.

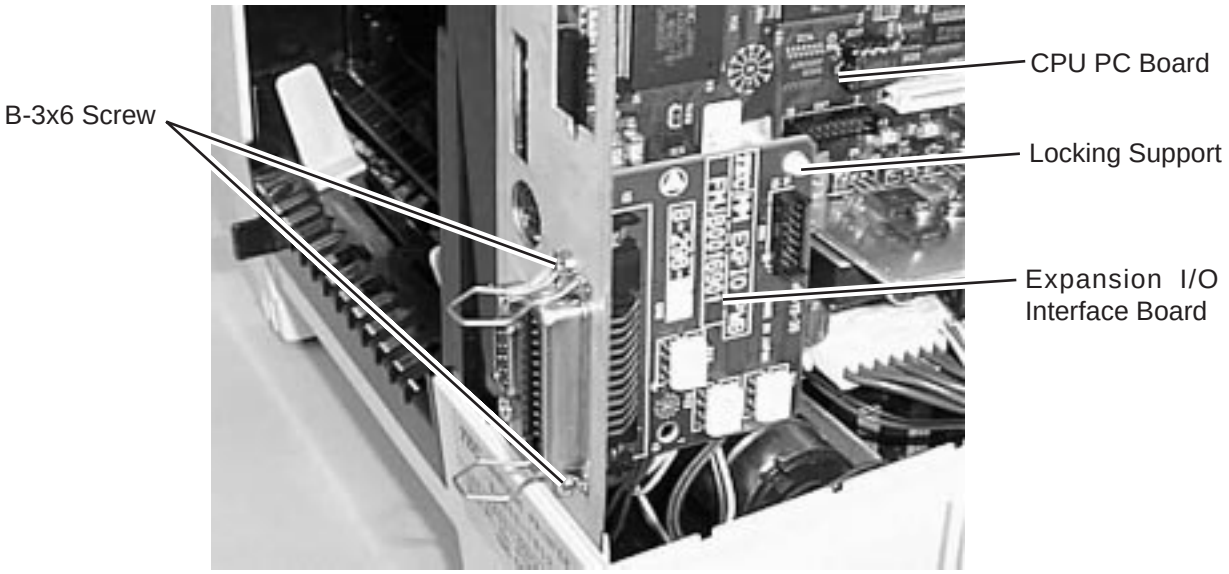


Fig. 3-22

6) Connect CN1 on the expansion I/O interface board to CN7 on the CPU PC board with the expansion I/O cable.

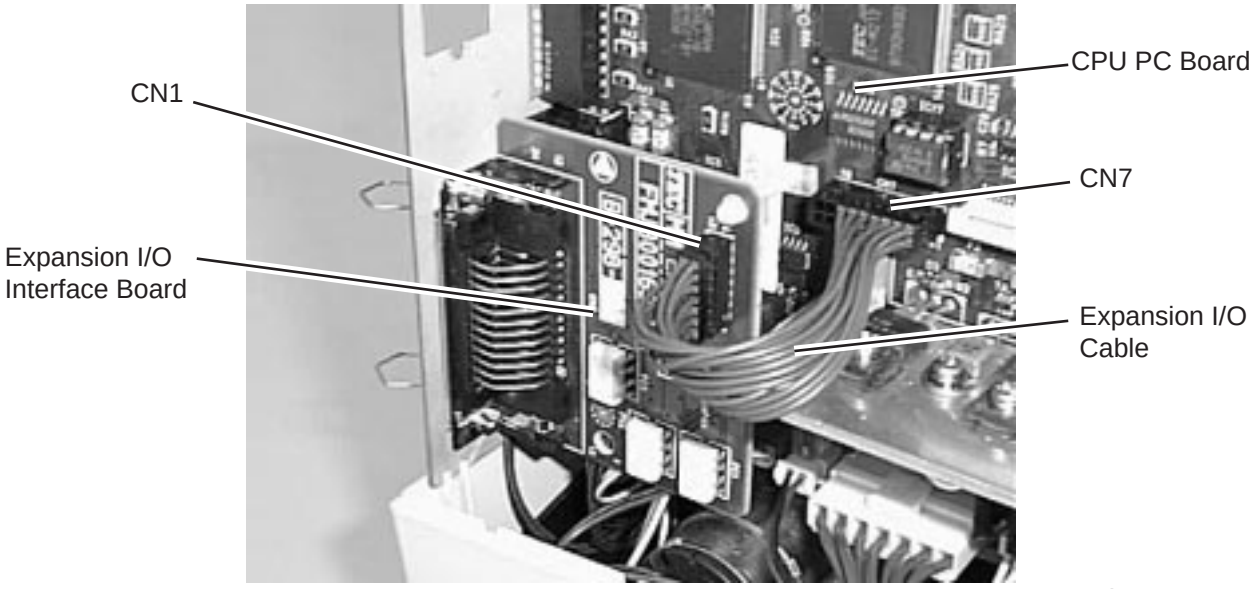


Fig. 3-23

7) Reassemble the top cover, and side cover L in the reverse order of removal.

NOTES: *1. Be careful not to pinch the harnesses by the covers when installing the expansion I/O interface board.*

2. The optional expansion I/O interface board can be installed on the B-452-TS model only.

3.4 EXPANSION MEMORY BOARD (B-7804-E1M-QM)

3.4.1 Packing List

All the following parts are supplied with the kit. Make sure you have all items shown below.

NOTE: *The B-7804-E1M-QM can be used for the products manufactured before August '99 (Serial No. 9Nxxxxxx or earlier).*

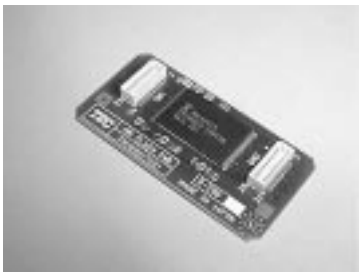
Expansion Memory Board (1 pc.)	Installation Manual (1 pc.)
	

Fig. 3-24

3.4.2 Installation Procedure

1) Turn the power off.
2) Open the top cover and remove the two PT-3x10 screws. (Refer to section 3.1.)
3) Disconnect the KEY LED harness from CN14 on the CPU PC board to detach the side cover L. (Refer to section 3.1.)
4) Connect CN1 and CN2 on the expansion memory board to CN10 and CN6 on the CPU PC board, respectively.

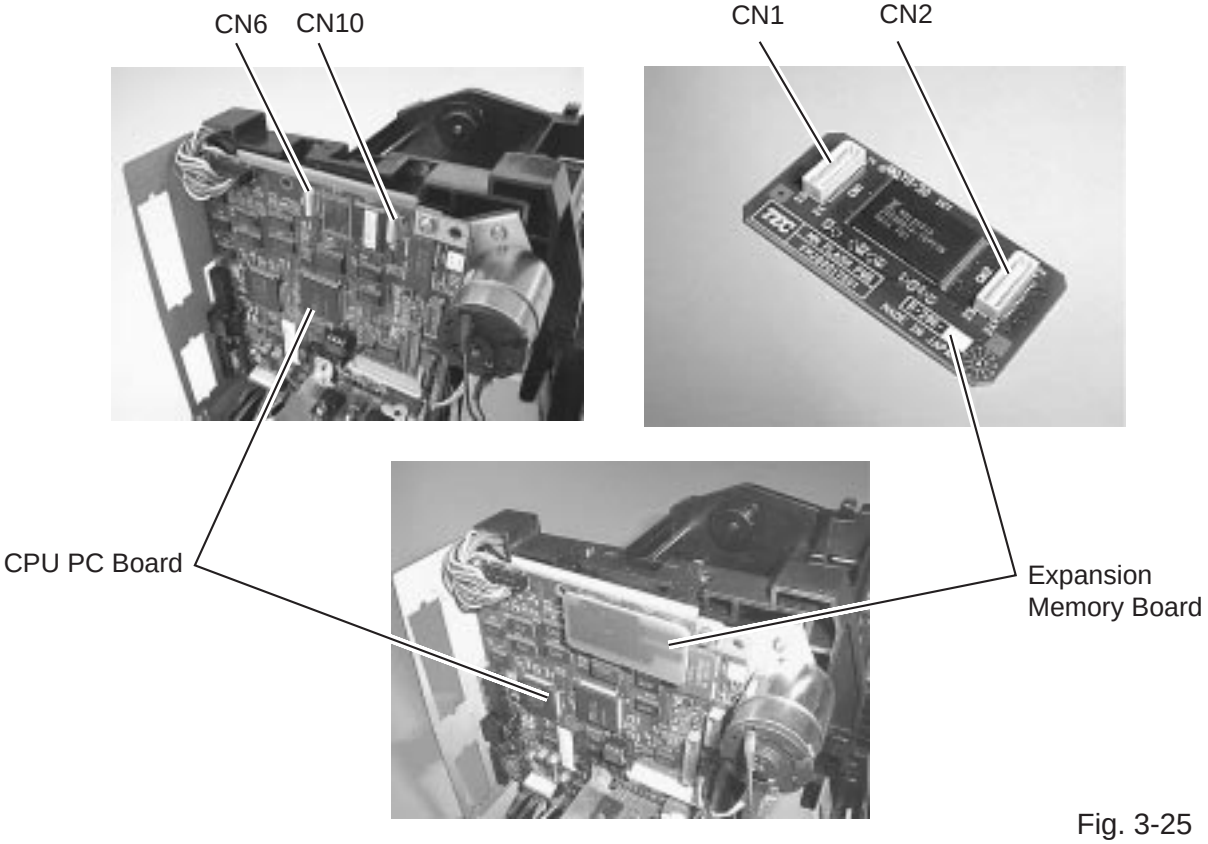


Fig. 3-25

5) Reassemble the top cover, and side cover L in the reverse order of removal.
NOTE: *Be careful not to pinch the harnesses by the covers when installing the expansion memory board.*

3.5 LAN I/F BOARD (B-7704-LAN-QM)

3.5.1 Packing List

All the following parts are supplied with the kit. Make sure you have all items shown below.

LAN Board (1 pc.)	LAN Flat Cable (1 pc.) Locking Support (1 pc.) B-3 x 6 Screw (2 pcs.)	Installation Manual (1 pc.)

Fig. 3-26

3.5.2 Installation Procedure

1) Turn the power off.
2) Open the top cover and remove the two PT-3x10 screws. (Refer to section 3.1.)
3) Disconnect the KEY LED harness from the LED PC board to remove the side cover L.

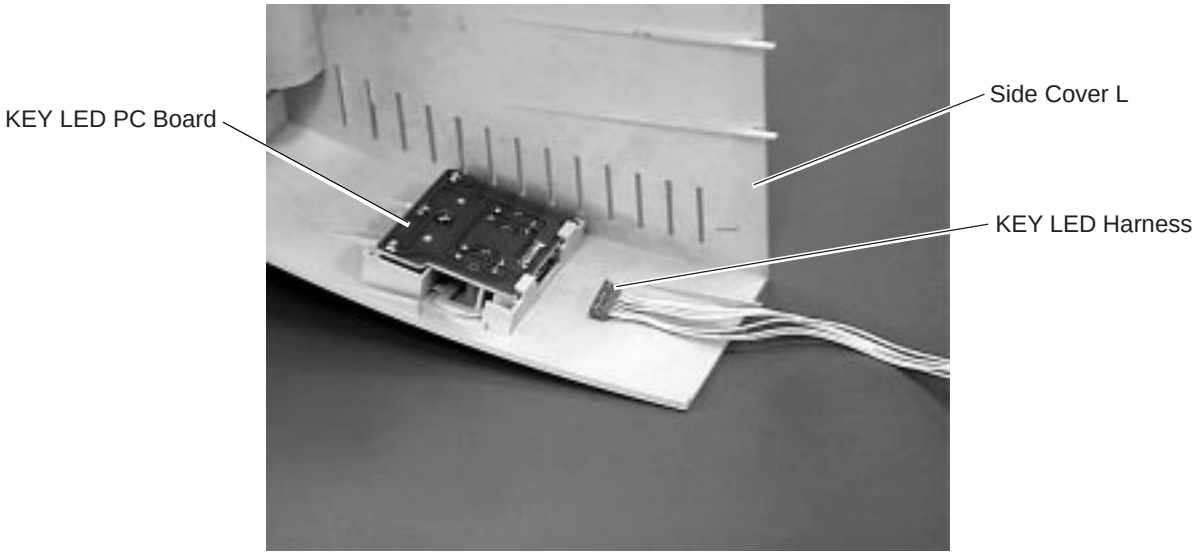


Fig. 3-27

4) Connect the LAN flat cable to CN11 on the CPU PC board in the orientation indicated below.

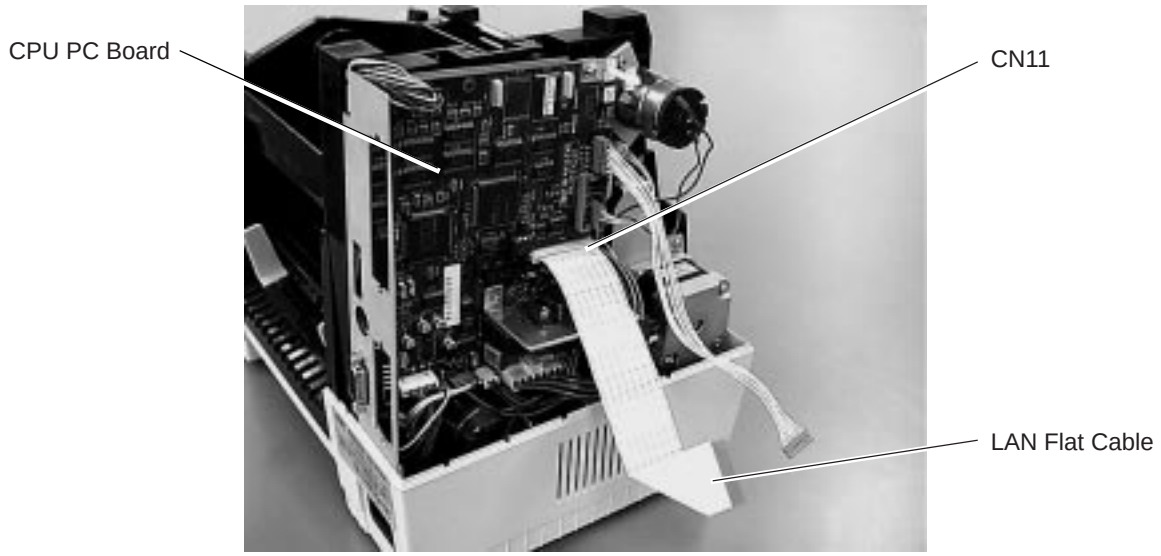


Fig. 3-28

5) Secure the LAN board to the CPU PC board with a locking support and two bind screws(B-3 x 6). Connect the other end of the LAN flat cable to J3 on the LAN board.

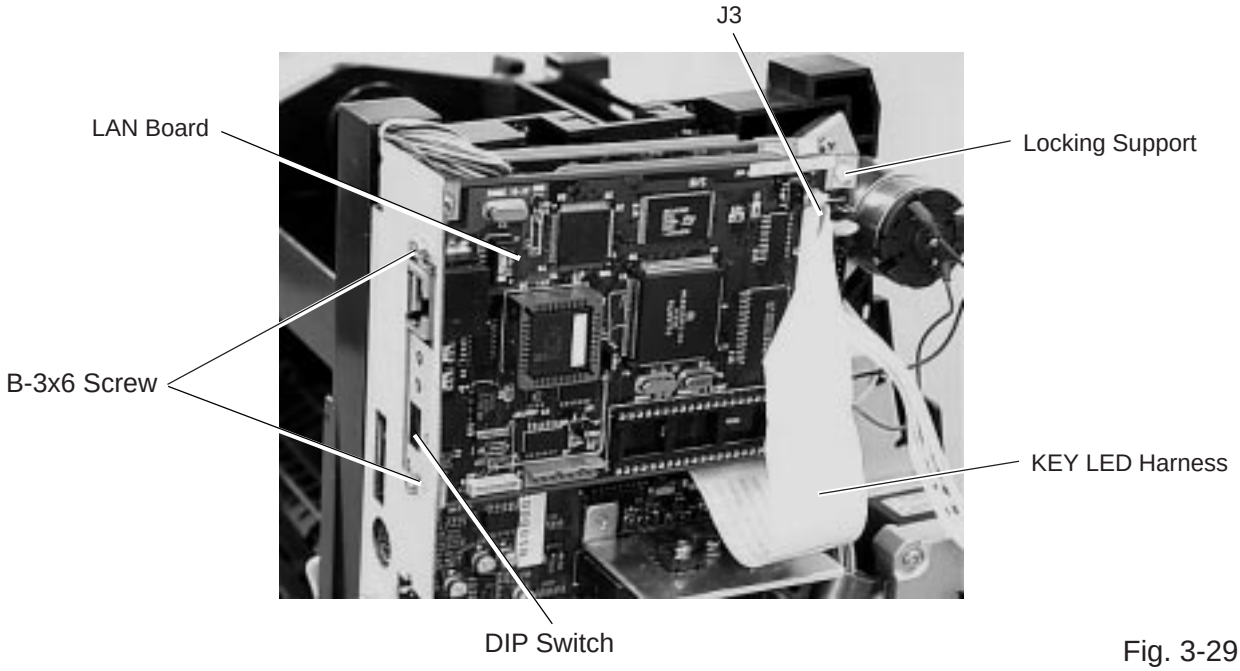


Fig. 3-29

NOTE: *Do not change the setting of the DIP switch installed on the LAN board. (All off)*

6) After installing the LAN board, reassemble in the reverse order of removal.
NOTE: *The optional LAN I/F board can be installed on the B-452-TS model only.*

3.6 PROGRAMMABLE KEYBOARD (KB-80-QM)

WARNING!
Be sure to turn the printer power OFF before connecting the KB-80-QM to the printer.

3.6.1 Installation Procedure

1) Turn off the printer power.
2) Connect the DIN cable of the KB-80-QM to the DIN connector of the B-450 printer.

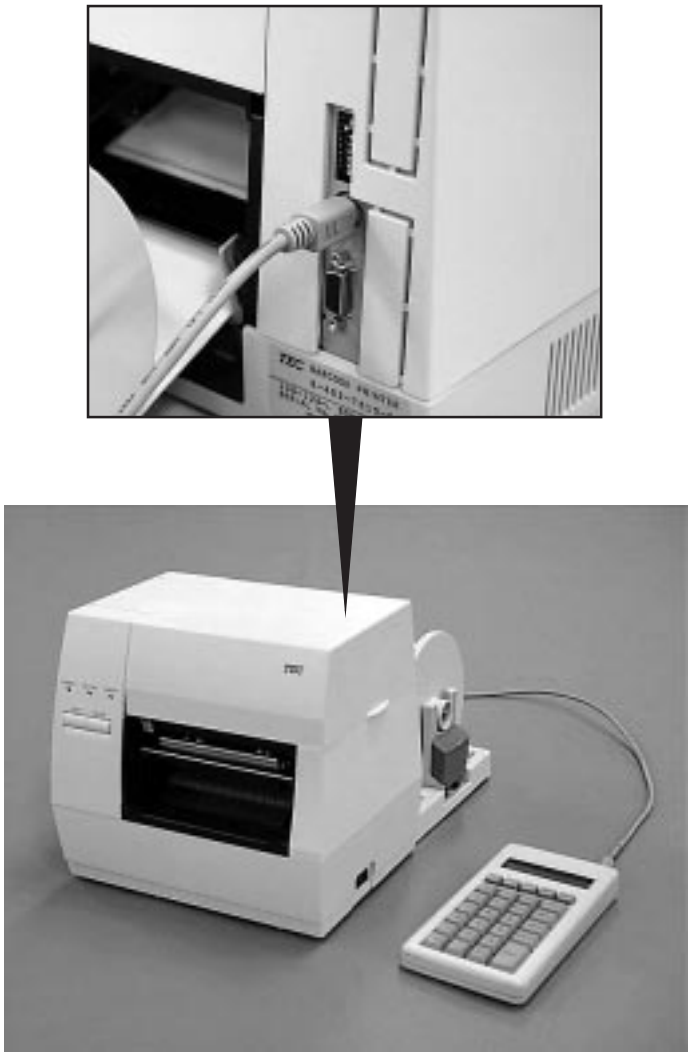


Fig. 3-30

3) Turn on the printer power.

NOTE: *When making an user's application program, refer to the KB-80-QM Basic Specifications and Key Unit Interface Specifications.*

3.7 STRIP MODULE (B-7904-H-QM)

WARNING!

1. *Disconnect the power cord before installing the strip module.*
2. *Be careful not to pinch the harnesses with the covers or strip module. Damaged harnesses may be short-circuited, causing electric shock, fire, or machine failure.*

3.7.1 Packing List

All the following parts are supplied with the kit. Make sure you have all items shown below.

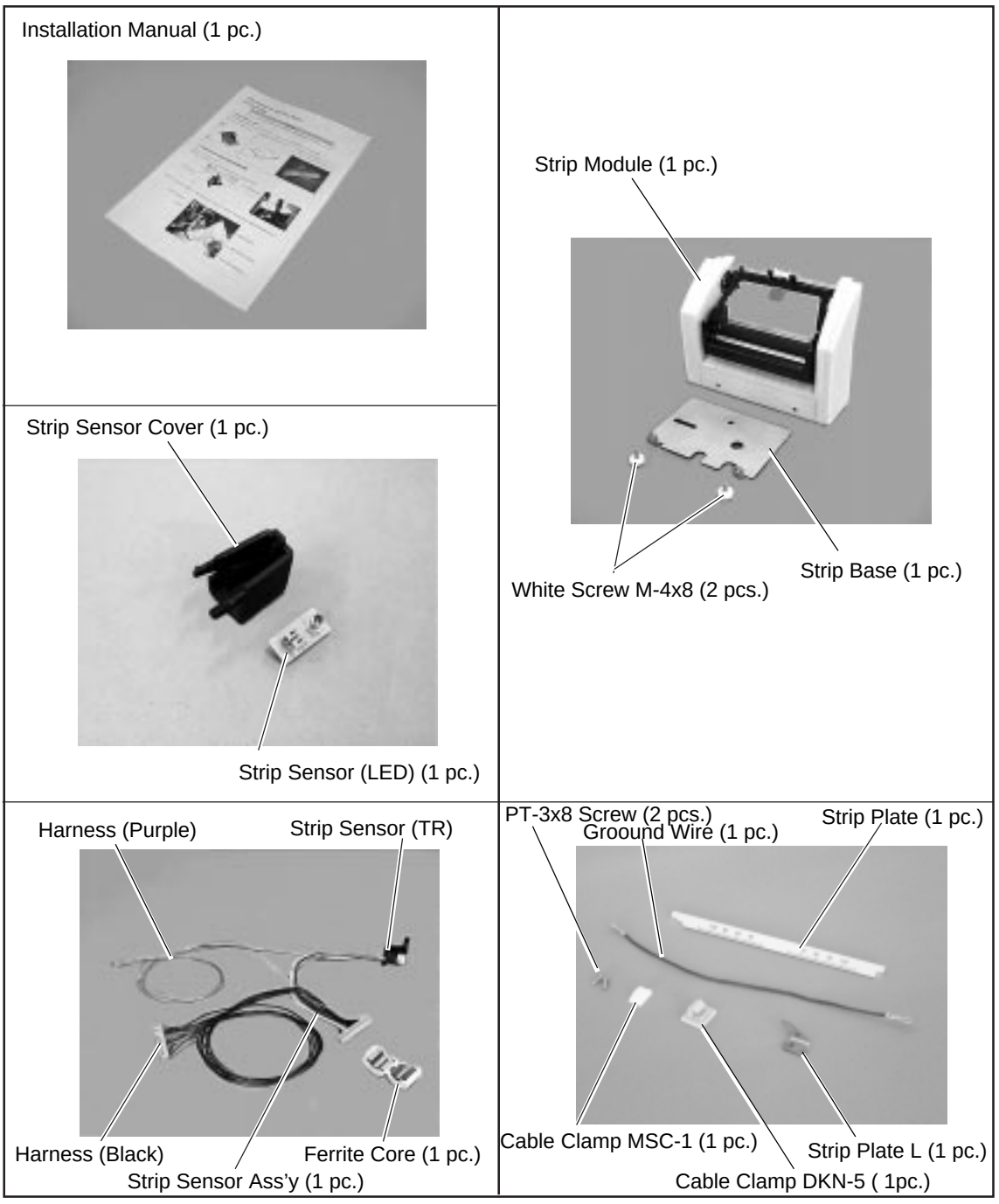

Installation Manual (1 pc.)
Strip Module (1 pc.)
Strip Sensor Cover (1 pc.)
Strip Base (1 pc.)
White Screw M-4x8 (2 pcs.)
Strip Sensor (LED) (1 pc.)
Harness (Purple)
Strip Sensor (TR)
PT-3x8 Screw (2 pcs.)
Grooound Wire (1 pc.)
Strip Plate (1 pc.)
Harness (Black)
Ferrite Core (1 pc.)
Strip Sensor Ass'y (1 pc.)
Cable Clamp MSC-1 (1 pc.)
Strip Plate L (1 pc.)
Cable Clamp DKN-5 (1pc.)

Fig. 3-31

3.7.2 Installation Procedure

1) Turn the power off.
2) Open the top cover and remove the two PT-3x10 screws. (Refer to Section 3.1.)
3) Disconnect the KEY LED harness from CN14 on the CPU PC board to detach the side cover L. (Refer to section 3.1.)
4) Remove the PT-3x10 screw to detach the side cover R. (Refer to section 2.3.)
5) Attach the enclosed cable clamps MSC-1 and DKN-5 as shown below.

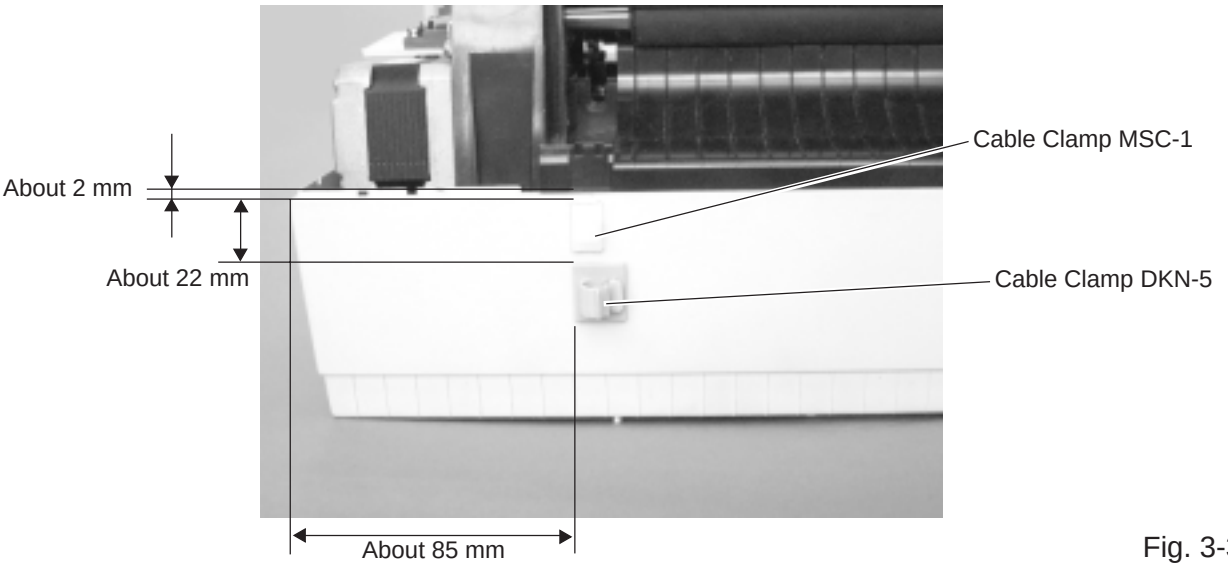


Fig. 3-32

6) For TS Model
Open the print head block, and then detach the paper guide base.

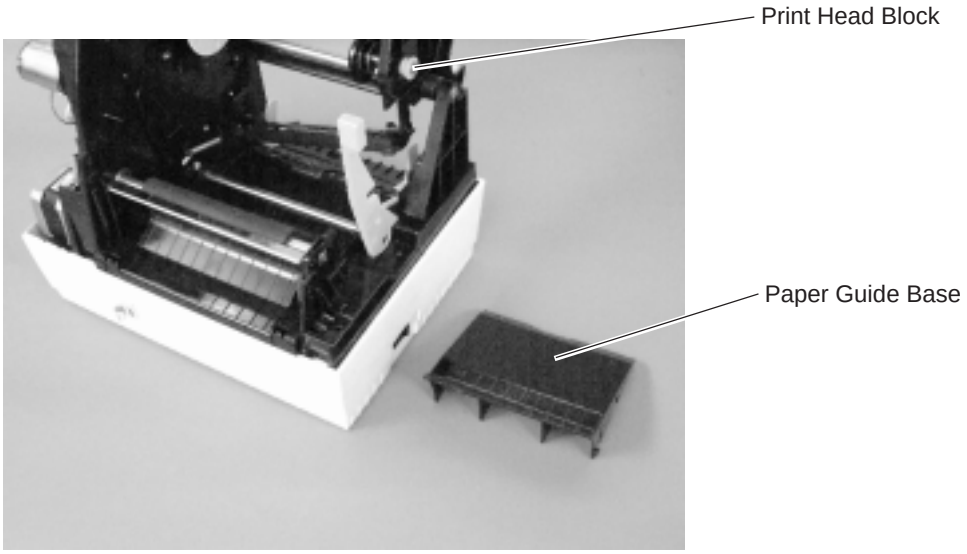


Fig. 3-33

For HS Model
Open the print head block. The sensor block is fixed to the printer by the two hooks enclosed by the circles in the figure below. Release the hooks by pushing them in the direction indicated by the arrows, and remove the sensor block.

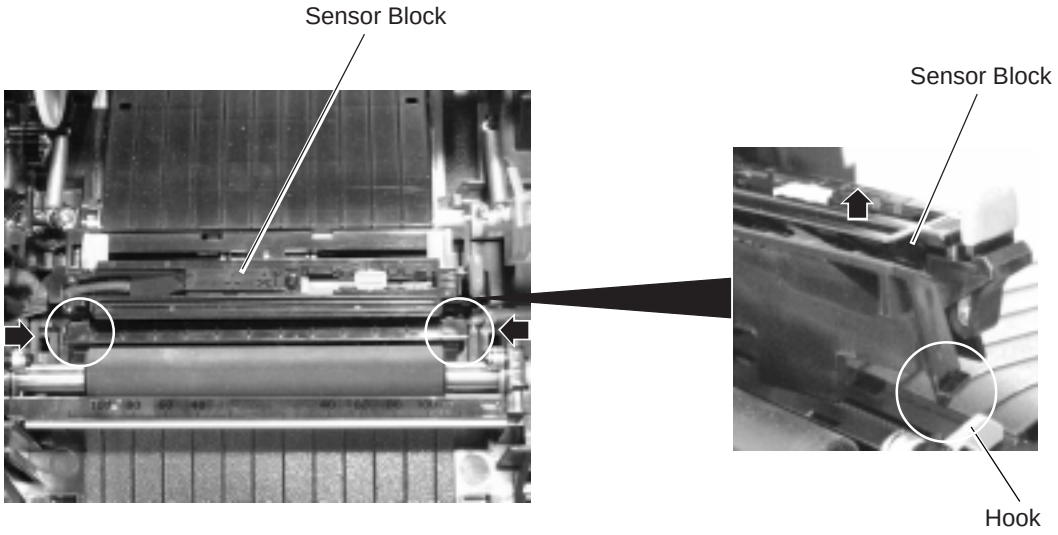


Fig. 3-34

7) Insert the two harnesses (black and purple) of the enclosed strip sensor ass'y and the ground wire into the square hole from the outside of the frame (CPU PC board side) to the inside of the frame (Platen side).

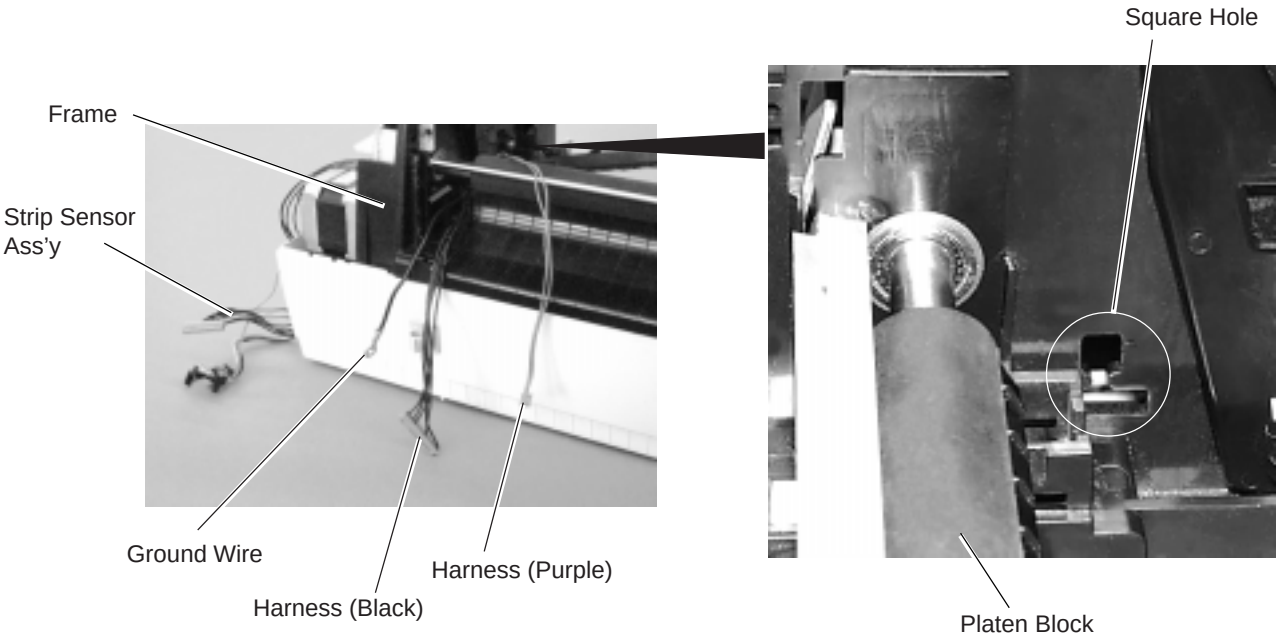


Fig. 3-35

NOTE: *For the HS model, be careful that the strip sensor harness does not get entangled in the media sensor harness which has been led through the square hole.*
When the media sensor harness is entangled, it may be difficult to adjust the media sensor position.

8) Install the strip sensor harness (purple) under the three tabs, and then lead it to the front of the printer.

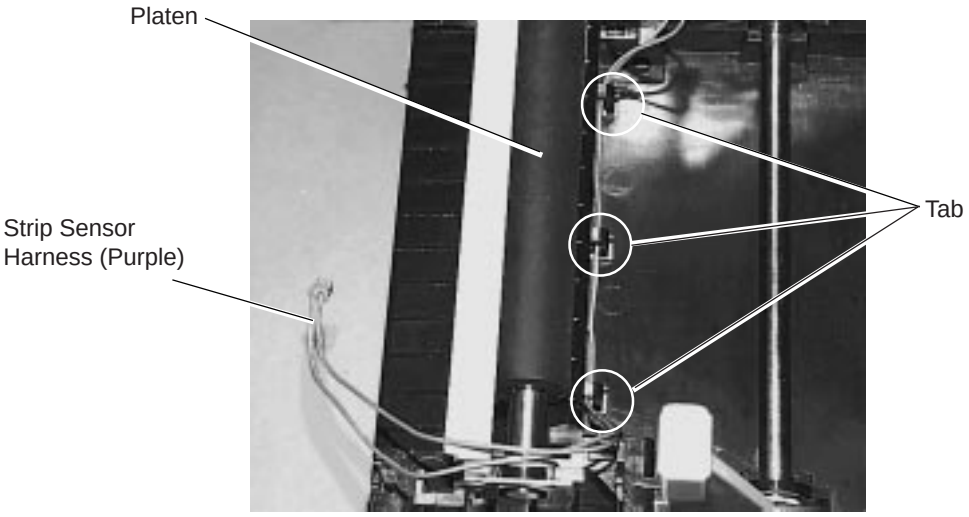


Fig. 3-36

9) Connect the strip sensor harness (purple) to the strip sensor (LED), and then fit the strip sensor (LED) to the strip sensor cover.

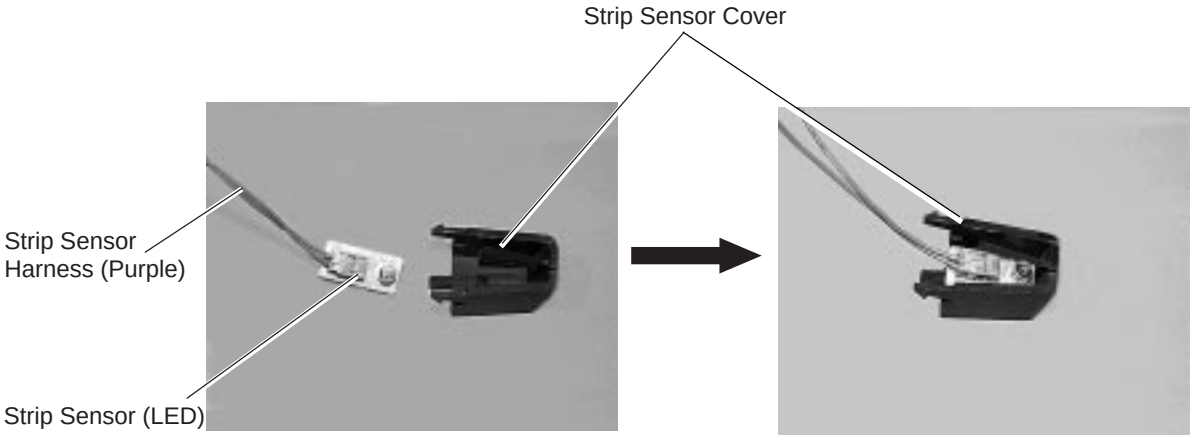
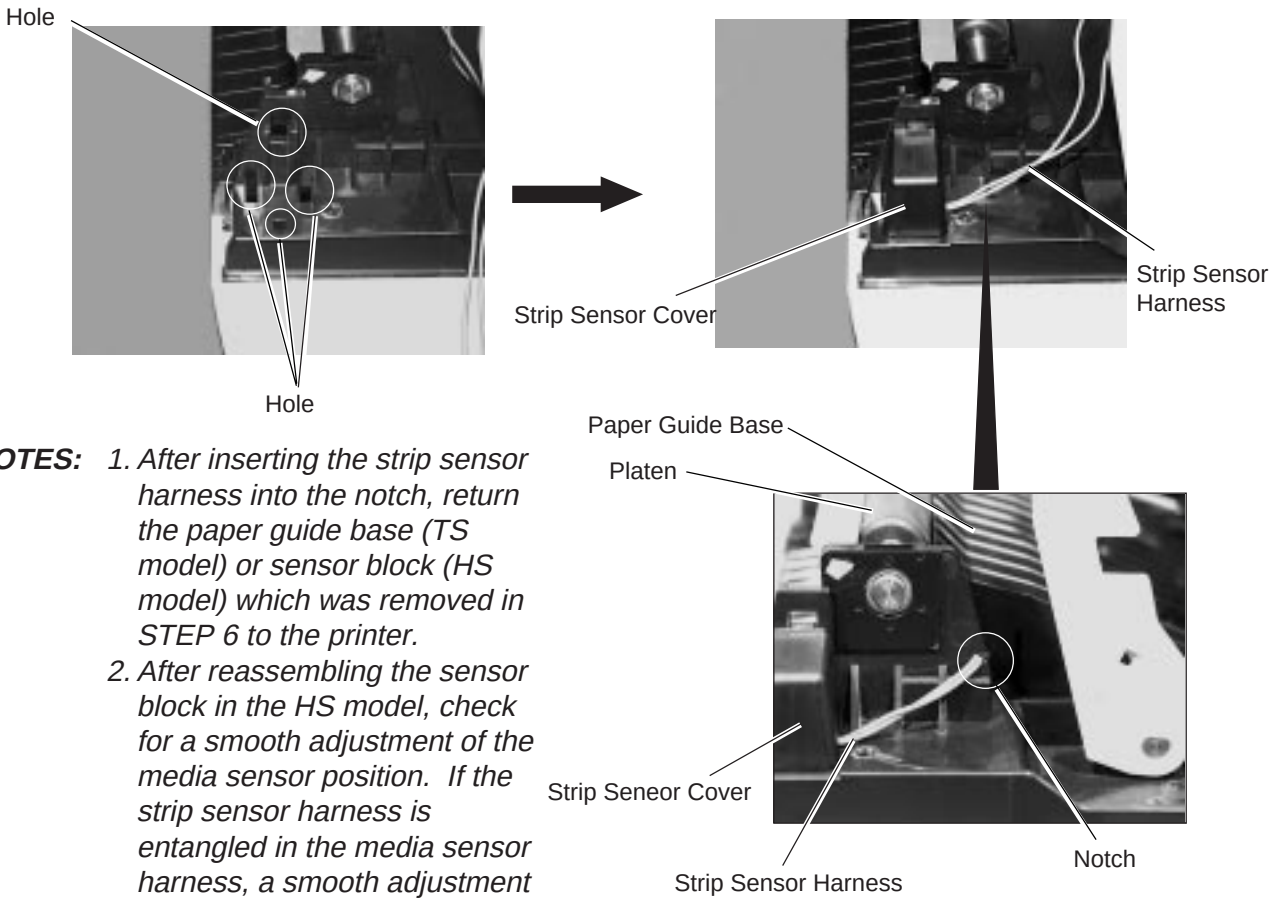


Fig. 3-37

10) Fit the strip sensor cover to the four holes in the right side of the printer.



NOTES:
1. *After inserting the strip sensor harness into the notch, return the paper guide base (TS model) or sensor block (HS model) which was removed in STEP 6 to the printer.*
2. *After reassembling the sensor block in the HS model, check for a smooth adjustment of the media sensor position. If the strip sensor harness is entangled in the media sensor harness, a smooth adjustment cannot be performed. Refer to STEP 7 and lead the strip sensor harness again.*

Fig. 3-38

11) Lead the strip sensor harness (black) and the ground wire under the platen, and then fix them with the cable clamp MSC-1 and the cable clamp DKN-5.

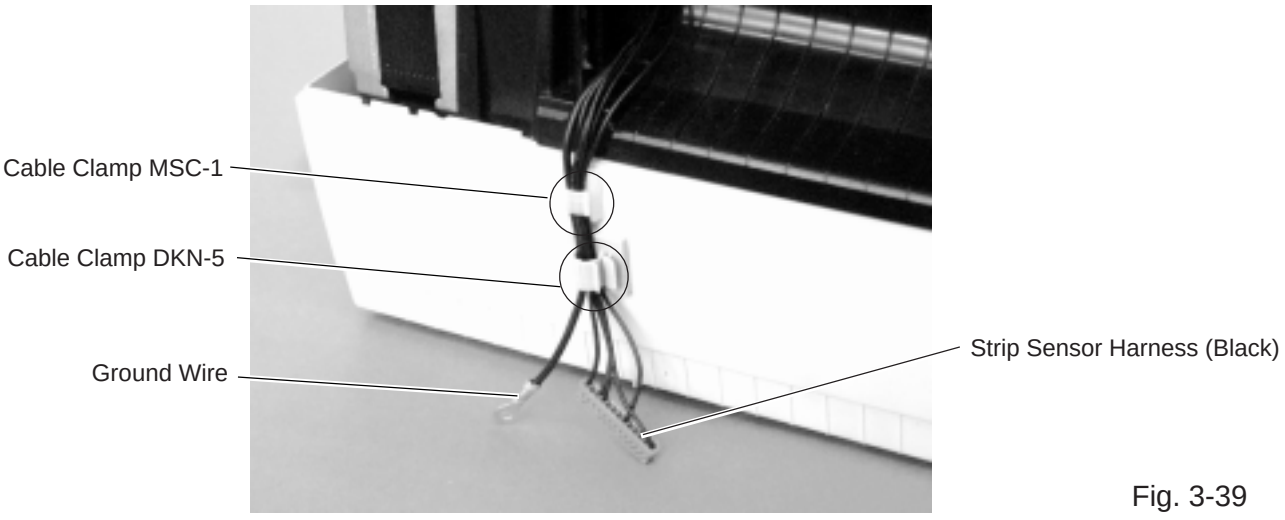


Fig. 3-39

12) Insert the projection on the bottom of the printer into a small hole in the strip base.

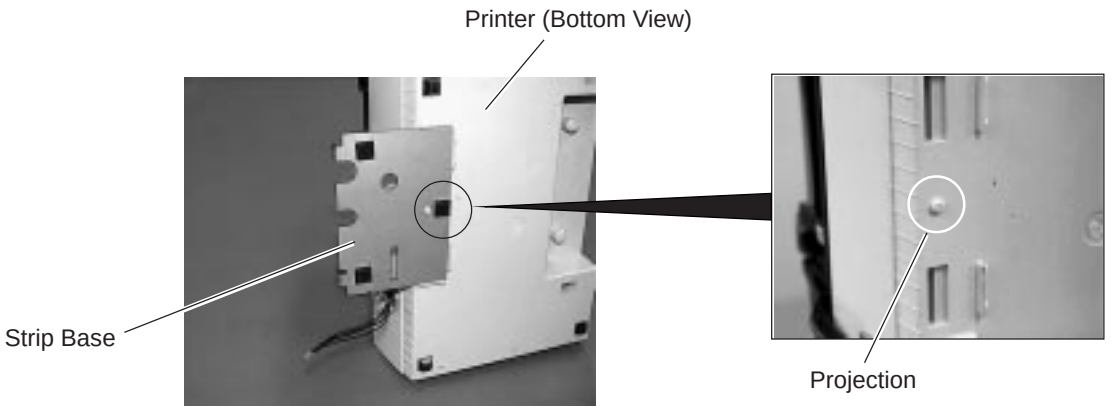


Fig. 3-40

13) Connect the strip sensor harness (black) to the connector of the strip module, and secure the ground wire to the strip module with the screw as shown in the figure below.

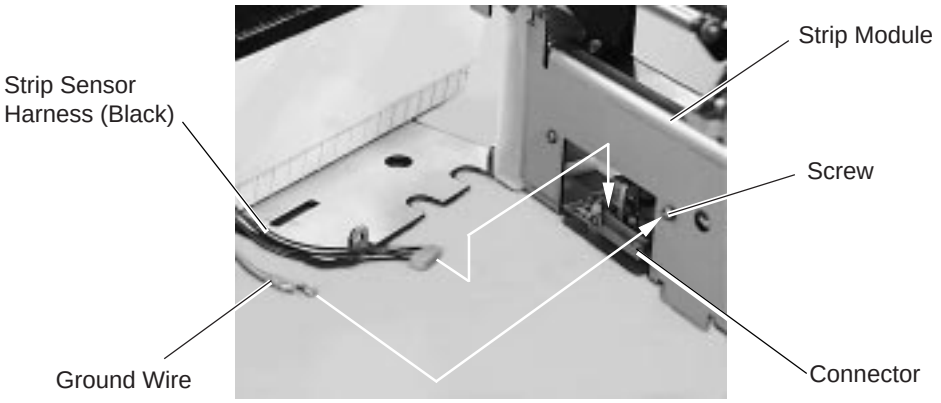


Fig. 3-41

14) Unhook and remove the platen block from the printer by pulling it up.

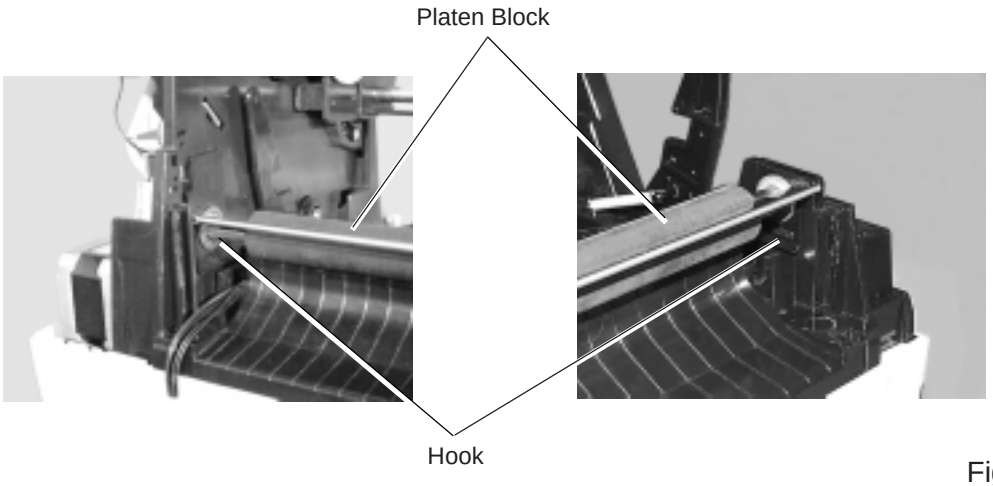


Fig. 3-42

15) Exchange the paper scale of the platen block with the enclosed strip plate.

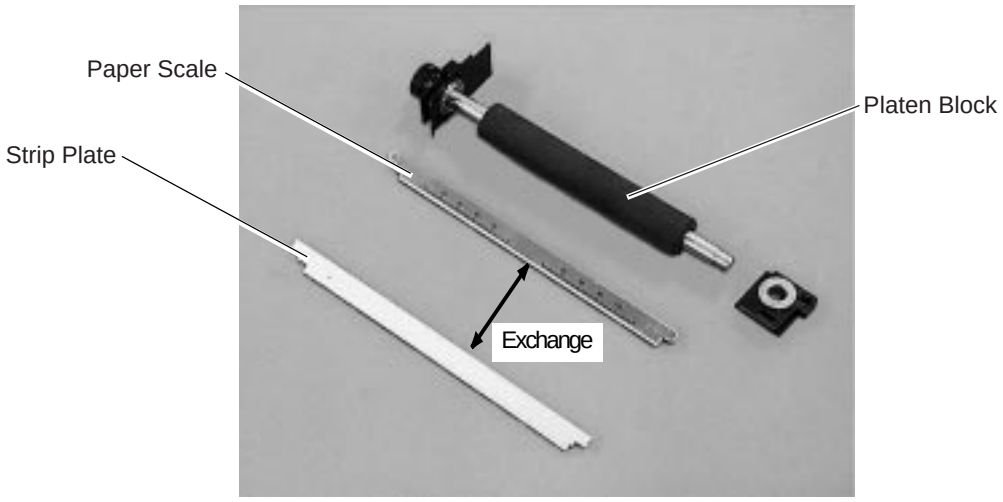


Fig. 3-43

16) Attach the strip module to the printer so that the upper guide plate of the right side of the strip module is inserted into slit B and the lower guide plate on the left side of the strip module is inserted into slot A.

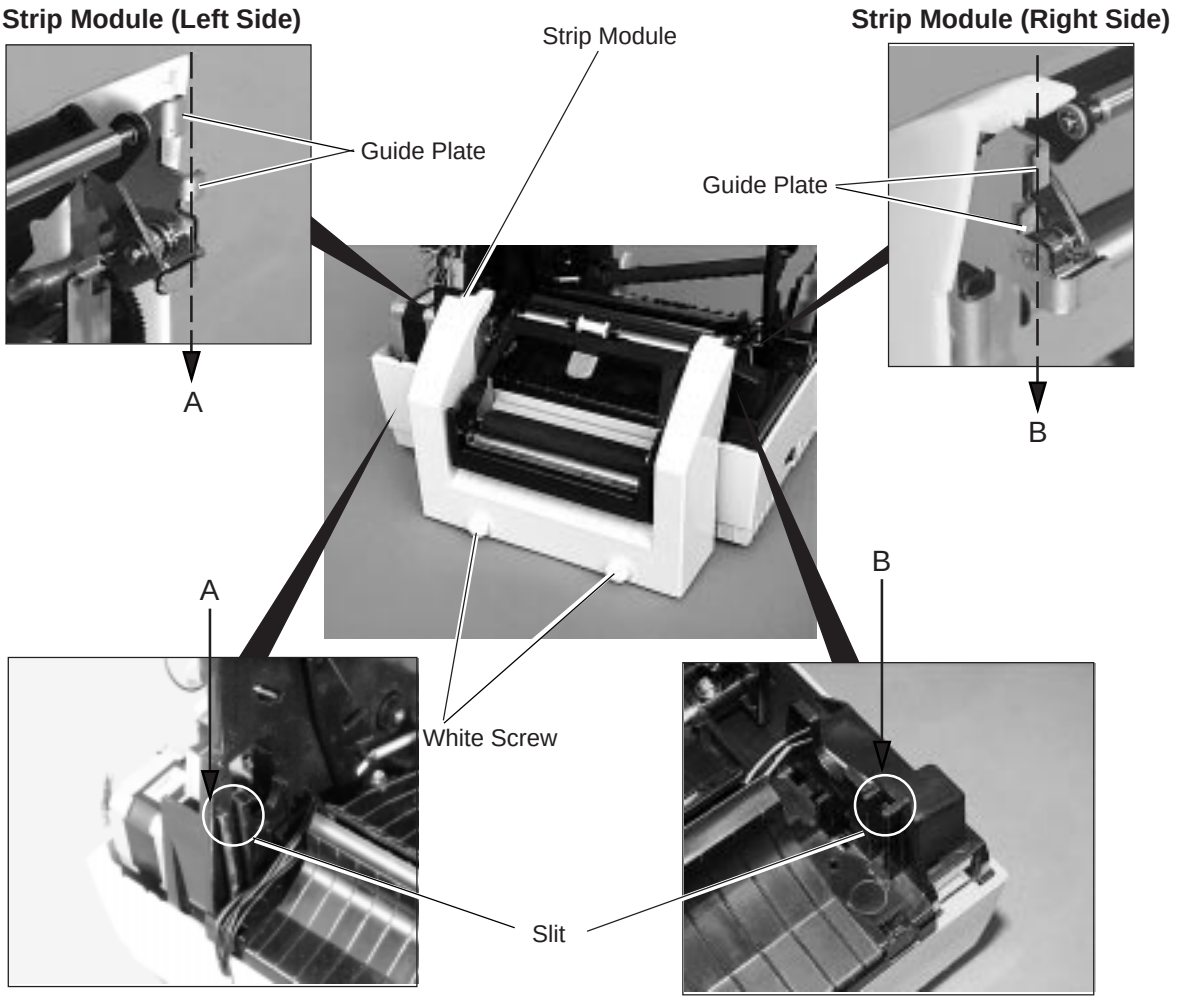


Fig. 3-44

17) Secure the strip module with the enclosed PT-3x8 screw to the printer.

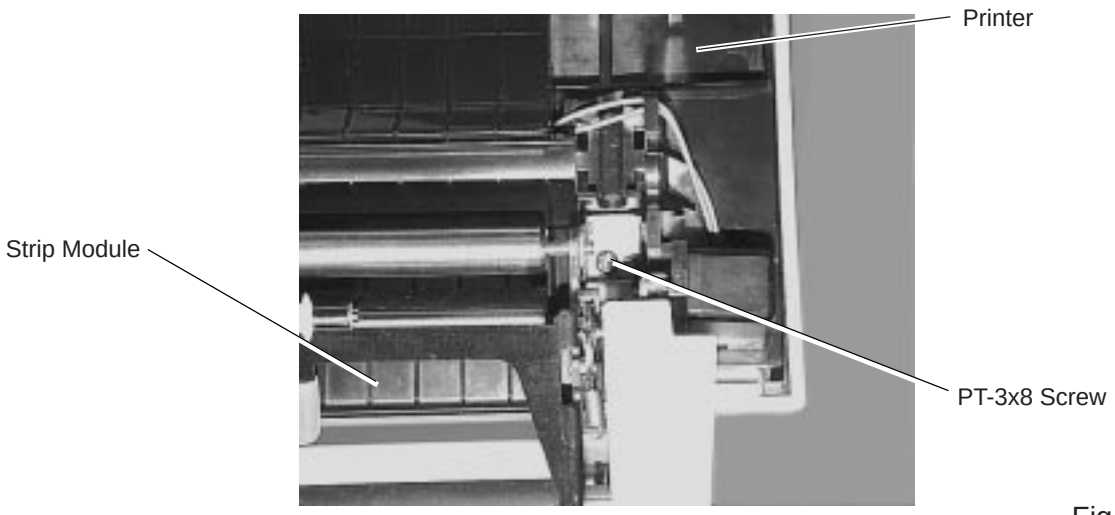


Fig. 3-45

18) Unhook the strip lever by pushing it, and open the strip module.
19) Put aside the strip sensor harness (black) and the ground wire to attach the strip plate L to the frame base with the enclosed PT-3x8 screw. Ensure that the strip plate L holds the plate behind the hook plate L.

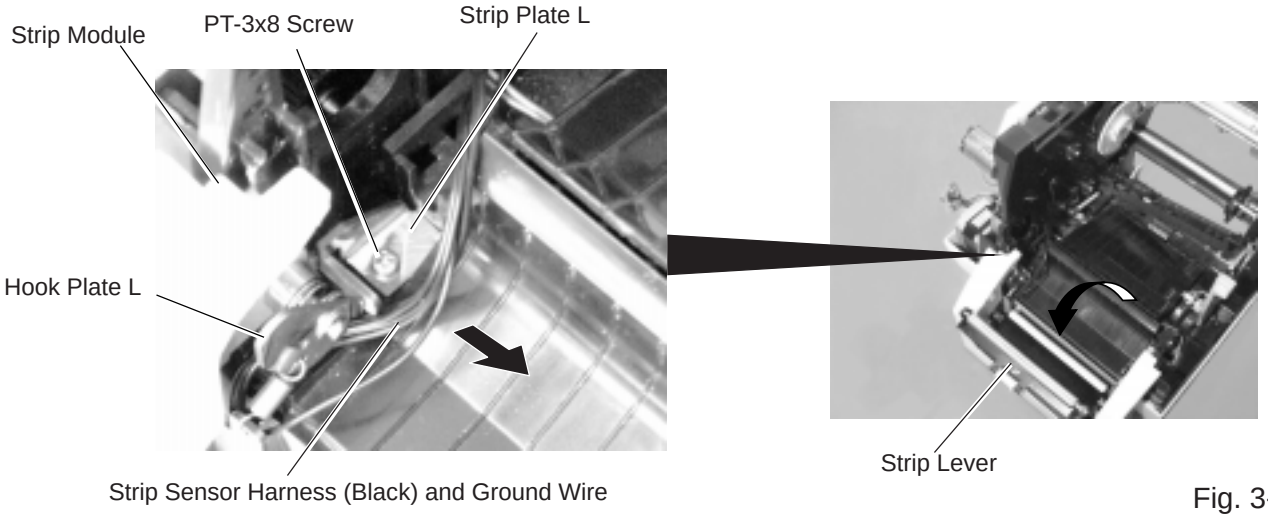


Fig. 3-46

20) Take out slack of the strip sensor harness (black) and the ground wire by pulling them from the CPU PC board side.

> ***CAUTION:***
> *Do not pull the harness too strong. Damaged harness may cause a machine failure.*

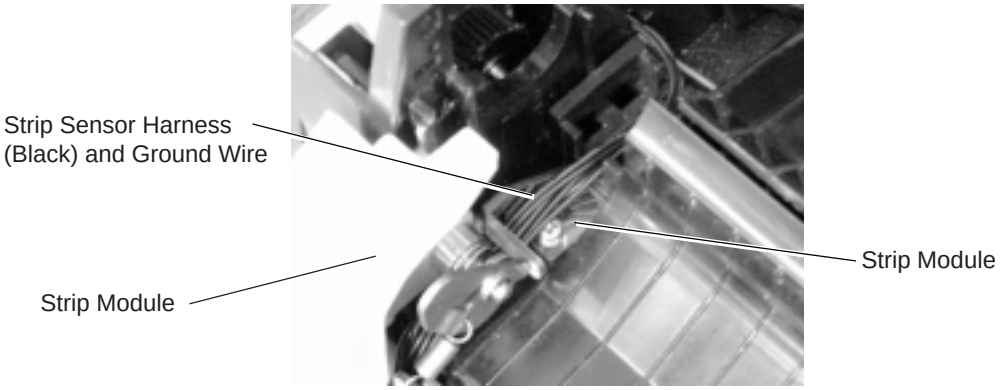


Fig. 3-47

21) Fix the ground wire to the CPU PC board with the PT-3x10 screw which secure the CPU PC board.

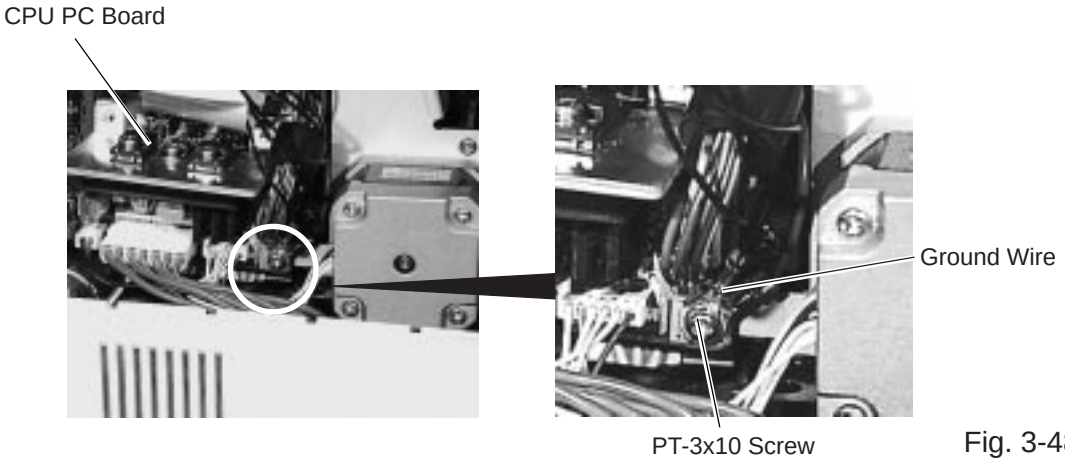


Fig. 3-48

22) For HS model only
Release the head control PC board from the three locking supports that secure it to the CPU PC board.

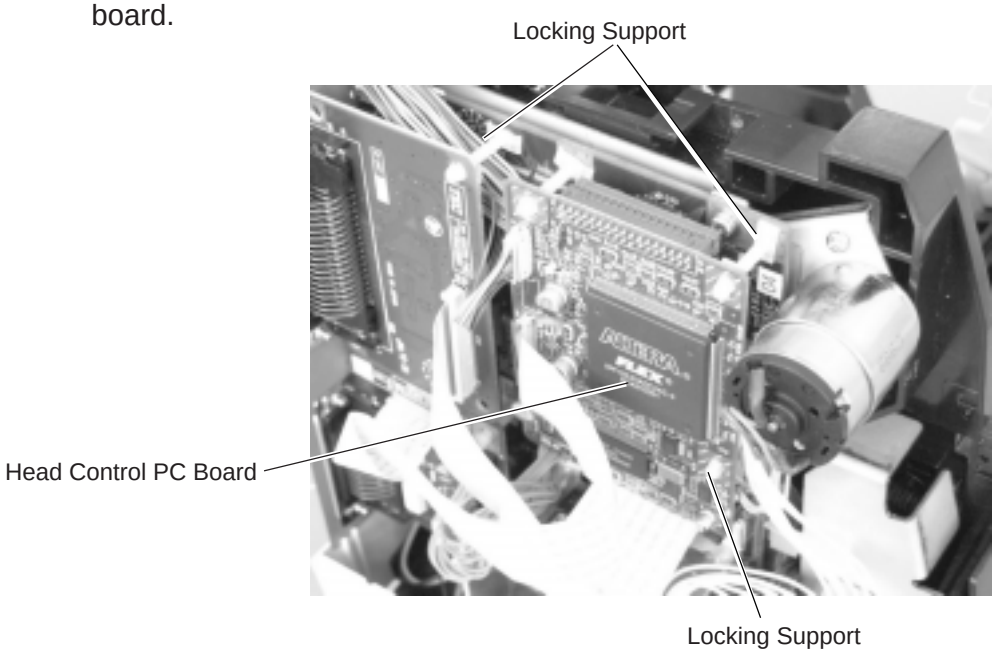


Fig. 3-49

23) Wind the strip sensor around the enclosed ferrite core one time, and connect the strip sensor harness (13 pins) to CN22 on the CPU PC board. Then, fit the strip sensor (TR) into the holes of the frame base.

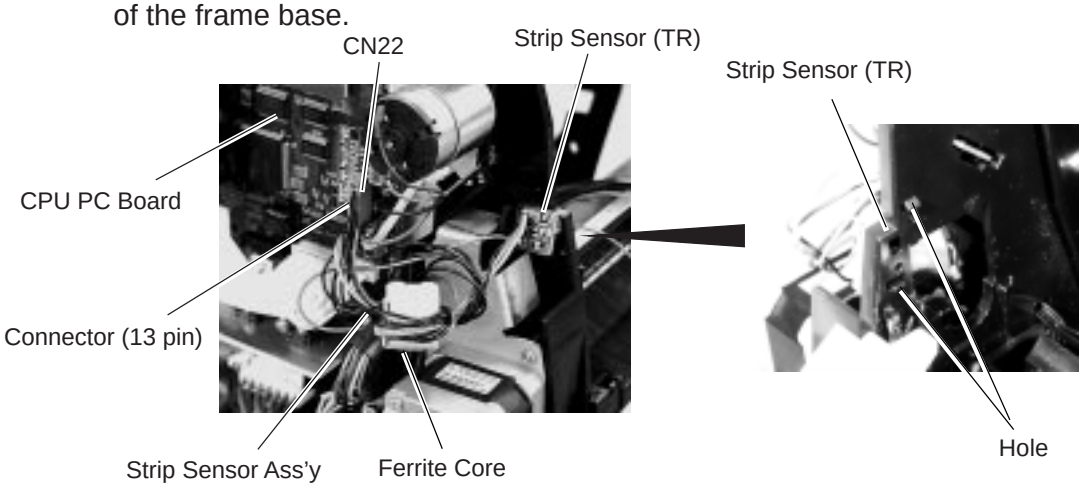


Fig. 3-50

24) Return the platen block detached in STEP14 to the printer, and close the print head block.

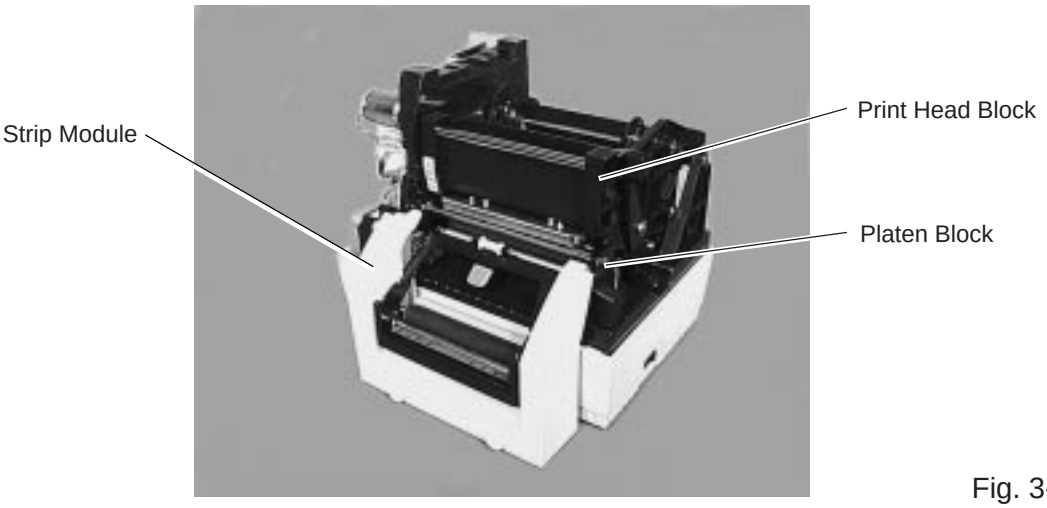


Fig. 3-51

25) Reassemble the side covers L and R and the top cover in the reverse order of removal. (Refer to Steps 2 to 4.) For the HS model, do not forget to reassemble the head control board that was removed in STEP 22.

4. TROUBLESHOOTING

Problems	Cause	Solution
Power is not turned ON.	1. Input voltage to the printer is not within the rated voltage. 2. Output voltage from the printer is not within the rated voltage. 3. CPU PC Board is not applied with voltage. 4. Failure of CPU PC board.	• Replace the power cord or power inlet. • Replace the PS unit. • Replace the power harness. • Replace the CPU PC board.
LED does not light.	1. Failure of the KEYLED PC board. 2. Failure of the KEYLED harness. 3. Failure of the CPU PC board.	• Replace the KEYLED PC board. • Replace the KEYLED harness. • Replace the CPU PC board.
Poor printing.	1. The print paper is of poor quality. 2. Dirty print head. 3. The head lever fastens the print head incompletely. 4. Alignment adjustment of the print head is improper.	• Use the paper approved by TOSHIBA TEC. • Clean the print head. • Fasten the head lever completely. • Re-adjust the print head.
Printer does not print.	1. Print head failure. 2. Connection of the print head connector is incomplete, a bad contact, or broken wires. 3. Failure of the CPU PC board. 4. Failure of the software. 5. Failure of the printer cable. 6. Failure of the HEAD CONTROL PC board. (HS model)	• Replace the print head. • Connect the harness completely, or replace the harness. • Replace the CPU PC board. • Check the program. • Replace the printer cable. • Replace the HEAD CONTROL PC Board.
Dot missing.	1. Broken element of the print head. 2. Broken wires of the print head cable. 3. Failure of the CPU PC board. 4. Failure of the HEAD CONTROL PC board. (HS model)	• Replace the print head. • Replace the print head harness. • Replace the CPU PC board. • Replace the HEAD CONTROL PC Board.
Blurred print.	1. Poor quality of paper. 2. Dust is attached to the paper.	• Use only TOSHIBA TEC specified paper. • Clean the print head and remove the dust from the paper.
Label feed failure.	1. Paper is not set properly. 2. Paper of poor quality. 3. Improper adjustment of the feed gap sensor or black mark sensor. 4. Failure of the feed gap sensor or blackmark sensor. 5. Labels cannot be stripped off the backing paper or the backing paper with labels cannot be would properly. 6. The cutter mechanism is not installed properly. 7. Failure of the stepping motor.	• Set the paper properly. • Use the paper approved by TOSHIBA TEC. • Re-adjust the sensor. • Replace the feed gap sensor or black mark sensor. • Replace the take-up motor or black mark sensor. • Install the cutter mechanism properly. • Replace the stepping motor or CPU PC board.
Communication error	1. Failure of the communication cable. 2. Failure of the RS-232C connector. 3. Failure of the communication connector. 4. Failure of the PC or application software. 5. Failure of the CPU PC board.	• Replace the cable. • Replace the connector. • Replace the connector. • Modify the program. • Replace the CPU PC board.

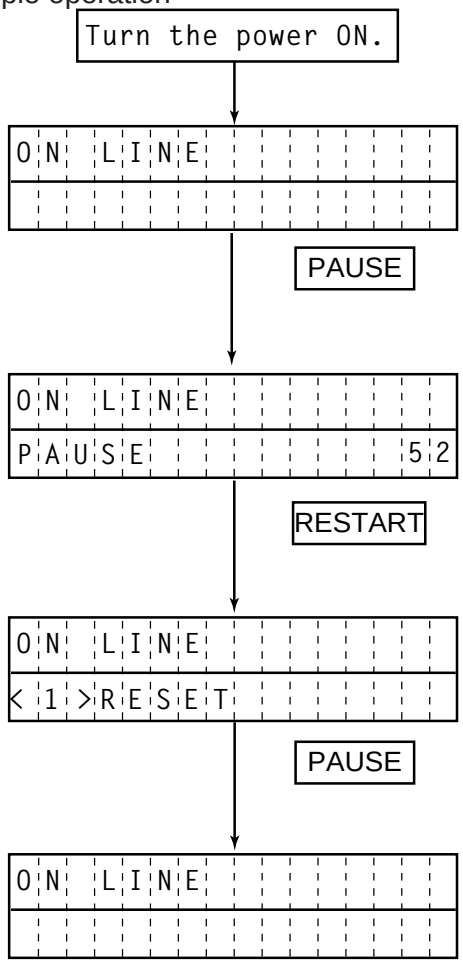
5. ON LINE OPERATION

5.1 RESET OPERATION

5.1.1 When using the KB-80-QM optional keyboard

This operation restores the printer to the initial status.

• Sample operation



(1) The printer is in stand-by or printing.

(2) Press the **[PAUSE]** key on the printer. (When the KB-80-QM optional keyboard is connected, press and hold the **[PAUSE]** key for at least 3 seconds.)

(3) The printer enters the pause state.

(4) Press and hold the **[RESTART]** key for at least 3 seconds.

(5) A reset menu is displayed.

(6) Press the **[PAUSE]** key.

(7) The printer is restored to the initial state.

NOTES: *1. If the **[RESTART]** key is released within 3 seconds in the pause state, the printer will resume printing without displaying the reset menu.*

*2. If the **[RESTART]** key is released within 3 seconds in the error and pause state, the printer will remain in error. However, in case of a communication error or command error, the printer will restore to the initial status.*

■ Key Function Table

Key Name	Function
[FEED] Key	Feeds a piece of paper. Feeds the paper to the print start position. When printing is performed with the print position misaligned, the printer cannot print data on a proper position, therefore, feed one or two pieces of paper to set the paper to the proper position before printing. Also sets the feed speed adjustment value.
[RESTART] Key	Restarts the label issue after a pause or an error. Restores the printer to the status after turning the power ON. Issues the label while the printer is on-line.
[PAUSE] Key	Pauses the label issue.

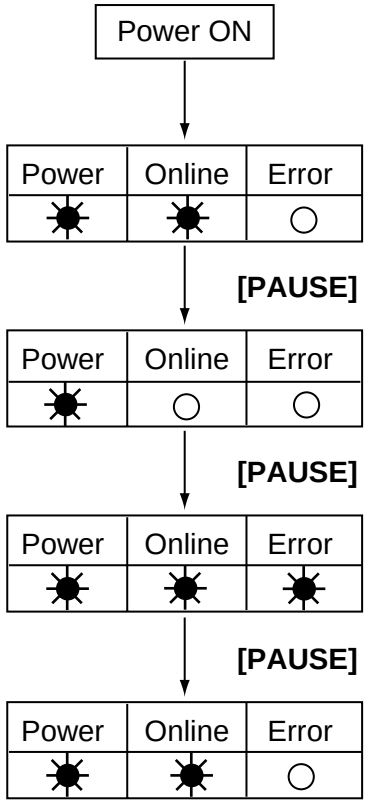
■ Display Indication Table

No.	LCD Message	Printer Status	Restoration by pressing the **[RESTART]** Key. Possible / Impossible
1	ON LINE	On-line mode	-
2	HEAD OPEN	The head is opened in on-line mode.	-
3	PAUSE ****	In a pause state	Possible
4	COMMS ERROR	A parity, overrun or framing error occurred during RS-232C communication.	Possible
5	PAPER JAM ****	A paper jam occurred during paper feed.	Possible
6	CUTTER ERR ****	An error occurred at the cutter module.	Possible
7	NO PAPER ****	The label has run out.	Possible
8	HEAD OPEN ****	Paper feed or issue is attempted with the head block opened.	Possible
9	EXCESS HEAD TEMP	The print head is too hot.	When the print head temperature becomes under 60°C, printing restarts automatically.
10	RIBBON ERR ****	Ribbon error (Ribbon error, ribbon break)	Possible
11	FLASH WRITE ERR.	An error has occurred when writing data into the flash memory.	Impossible
12	FORMAT ERROR	A deletion error occurred while formatting the flash memory.	Impossible
13	MEMORY OVERFLOW	No more data can be saved in the flash memory.	Possible
14	SYNTAX ERROR	Undefined command is retrieved.	Possible
15	STACK FULL ****	The stacker is full of paper.	Impossible
16	STACKER ERR ****	Printing was attempted while the stacker is off.	Impossible
17	THERM.UNCONNECT	Environment temperature thermistor is disconnected.	Impossible
18	HEAD ERROR	The print head has broken elements.	Impossible

**** : Remaining number of labels to be printed.

5.1.2 When using the operation panel

To abort paper issue and clear the data transferred from the PC to the printer, use the following procedure to reset the printer.



(1) Turn the power on.

The printer is in idle state or printing.

(2) Press the **[PAUSE]** key.

The printer enters the pause mode or stops printing.

(3) Press and hold the **[PAUSE]** key for 3 seconds or more in the pause state.

This LED state indicates the printer is in reset mode.

(4) Press the **[PAUSE]** key.

The printer returns to the initial state.

: ON
○ : OFF

NOTES: *1. When the printer is restorable, it will enter the reset mode after the **[PAUSE]** key is pressed and held for 3 seconds or more.*
*2. If the **[PAUSE]** key is released within 3 seconds while in pause or error state, the printer will start printing, not enter the reset mode. In case of errors such as paper end and cutter error, the printer will return to the initial state.*

■ Key Function Table (Operation Panel)

Key Name	Function
[FEED] Key	Feeds a piece of paper. Feeds the paper to the print start position. When printing is performed with the print position misaligned, the printer cannot print data on a proper position, therefore, feed one or two pieces of paper to set the paper to the proper position before printing. Also sets the feed speed adjustment value.
[PAUSE] Key	Pauses the label issue and printing. Restarts printing after a pause or an error.

■ LED Function Table (Operation Panel)

LED Name	Function
[POWER] LED	Indicates that the printer is ON.
[ON LINE] LED	Indicates that the printer is communicable.
[ERROR] LED	Indicates that the printer is in an error status.

■ LED Indication Table (Operation Panel)

No.	LED Indication			Printer Status	Restoration by pressing the **[PAUSE]** key Possible/Impossible	Status request reset command reception Possible/Impossible
	POWER	ON LINE	ERROR			
1	✷	✷	○	On-line mode	-	Possible
	✷	☼	○	On-line mode (during communication)	-	Possible
2	✷	○	○	The head cover is opened in on-line mode.	-	Possible
3	✷	○	○	Pause	Possible	Possible
4	✷	○	✷	A parity, overrun or framing error occurred during RS-232C communication.	Possible	Possible
5	✷	○	✷	A paper jam occurred during paper feed.	Possible	Possible
6	✷	○	✷	An error occurred at the cutter module.	Possible	Possible
7	✷	○	✷	The paper has run out.	Possible	Possible
8	✷	○	✷	Paper feed or issue is attempted with the print head block opened.	Possible	Possible
9	✷	○	✷	The print head is too hot.	When the print head temperature becomes under 60°C, printing restarts automatically.	Possible
10	✷	○	✷	Ribbon error (ribbon end, ribbon break)	-	Possible
11	✷	✷	○	Writable character and PC command registration mode	Impossible	Possible
12	✷	○	✷	An error occurred when writing data into the flash memory.	Impossible	Possible
13	✷	○	✷	A deletion error occurred while formatting the flash memoty.	Impossible	Possible
14	✷	○	✷	No more data can be saved in the flash memory.	Possible	Possible
15	✷	○	✷	Undefined command is retrieved.	Impossible	Possible
16	✷	○	✷	A zero-dividing error occurred.	Impossible	Impossible
17	✷	○	✷	A momentary power failure occurred.	Impossible	Impossible
18	✷	○	✷	Backup EEPROM is not read/ written properly.	Impossible	Impossible
19	✷	○	✷	The stacked paper is full.	Possible	Possible
20	✷	○	✷	The label issue is attempted when the stacker power is OFF.	Possible	Possible
21	✷	○	✷	The connector of the environmental temperature thermistor comes off.	Impossible	Possible
22	✷	○	✷	The prit head has broken elements.	Possible	Possible

✷ : ON
○ : OFF
☼ : BLINK

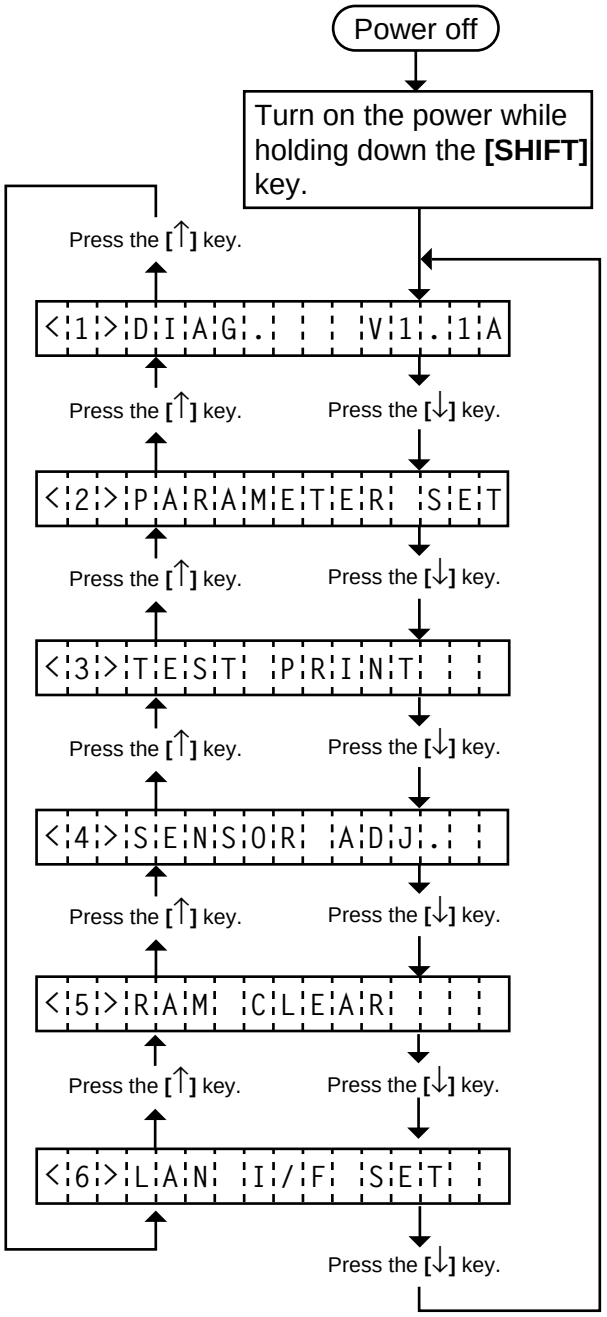
6. DIAG. TEST OPERATION

6.1 OUTLINE OF THE DIAG. TEST OPERATION

6.1.1 When using the KB-80-QM optional keyboard

In system mode the diag. test operation is used to diagnose the printer and to set the parameters by using the **[F1]**, **[↑]**, **[↓]** and **[→]** keys on the operation panel. Diag. test operation is started from the power off state. For further details, please refer to the corresponding pages.

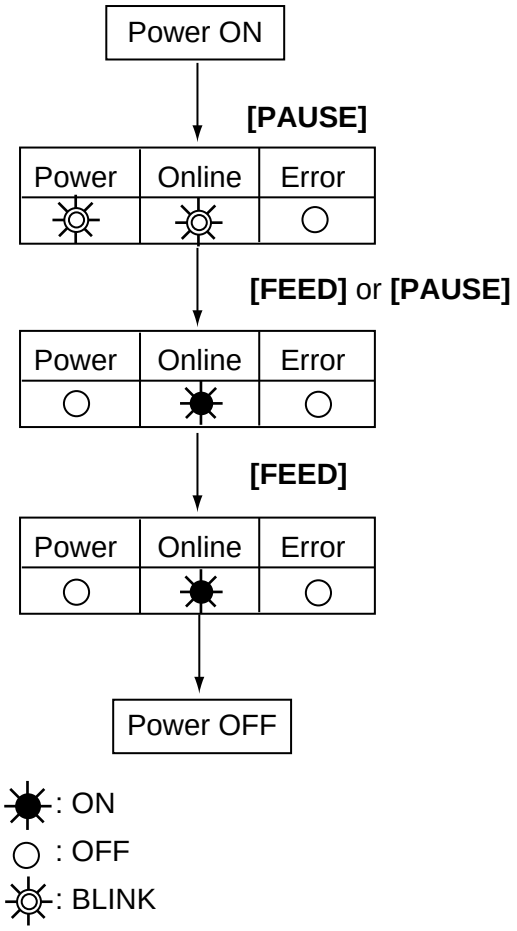
NOTE: *Every size in this manual is written in millimeter. To obtain the size in inch, divide by 25.4.*



- Self Test Mode (See page 6-3)
  Data from the maintenance counter and automatic diagnosis are printed on the paper. The result of the head broken element check is indicated in the display.
- Parameter Setting Mode (See page 6-11)
  Fine adjustment of the feed length, cut/strip position, reverse feed, X axis, print tone and the threshold of the black mark sensor and the feed gap sensor, selection of character font, font zero, strip wait status, communication mode and the language of LCD message, and feed speed adjustment are available in this mode.
- Test Print Mode (See page 6-38)
  Print condition and test print type (slant lines, characters, and bar codes) are selectable.
- Sensor Setting Mode (See page 6-47)
  A thermistor check and the setting of the black mark and feed gap sensors are available in this mode.
  A transmission check is made to both a print head thermistor and an environmental temperature thermistor.
- RAM Clear Mode (See page 6-49)
  Data from the maintenance counter is cleared and parameter setting is initialized in the RAM clear mode.
- LAN I/F Setting Mode (See page 6-54)
  Each parameter setting of the LAN I/F is available in this mode. (This mode is valid when the LAN I/F board is installed into the printer.)

NOTE: *The parameter setting for each mode is displayed on the second line.*

6.1.2 When using the operation panel



(1) Turn the power ON while pressing and holding the **[PAUSE]** key.

(2) Self diagnosis is performed.

(3) Start a self diagnosis print.
- In case of thermal transfer print, press the **[FEED]** key.
- In case of thermal direct print, press the **[PAUSE]** key.

(4) Start the test print by pressing the **[FEED]** key.

(5) Turn the power OFF.

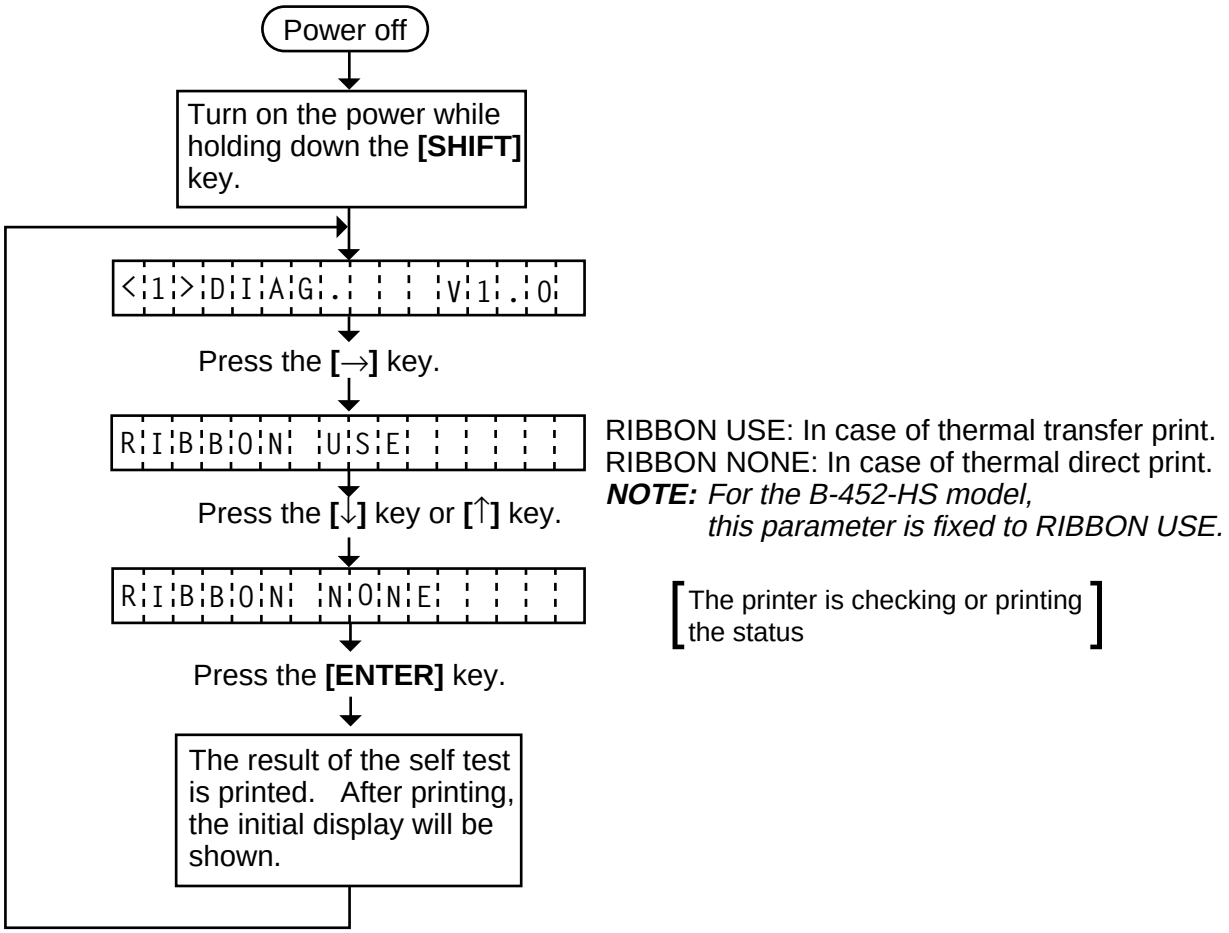
NOTES:
1. *When an error occurs during printing, the error LED is lit and printing is stopped. The error can be cleared by pressing the **[PAUSE]** key and the printer restores to the copy/print tone selection. Auto-reissue is not performed after the error is cleared.*
2. *The default parameter at power on is as below:*
   •ISSUE COUNT: 1
   •PRINT SPEED: 2 inch/sec.
   •SENSOR: None
   •TYPE: Batch
   •LABEL LENGTH: 76mm (B-452-TS model) / 105 mm (B-452-HS model)
3. *Even if the auto paper feed has been performed in online mode, an auto reverse feed is not performed when starting a test print.*
4. *After a self diagnosis print, an auto reverse feed is not performed for printing the first paper in online mode.*
5. *After the print head is raised and lowered, the auto paper feed is canceled.*
6. *Regarding the details of the self diagnosis print and test print, refer to sections 6.2 and 6.4, respectively. (Only slant lines (3 dot) are printed at the test print.)*

6.2 SELF TEST MODE (When using the KB-80-QM Optional Keyboard)

In self test mode the printer status is printed in two types of sample print.

6.2.1 Maintenance Counter and Automatic Diagnostic Printings

Maintenance Counter Printing
The data from (1) to (35) on a sample print A is printed. This data is the printer status and the value set in the parameter setting mode.
Automatic Diagnostic Printing
The data from (1) to (12) on a sample print B is printed.


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG. V1.0
Press the [→] key.
RIBBON USE
Press the [↓] key or [↑] key.
RIBBON NONE
Press the [ENTER] key.
The result of the self test is printed. After printing, the initial display will be shown.
RIBBON USE: In case of thermal transfer print.
RIBBON NONE: In case of thermal direct print.
NOTE: For the B-452-HS model, this parameter is fixed to RIBBON USE.
[The printer is checking or printing the status]

NOTES: *1. If the maintenance counter printing results in an error, the printer will display the error message and stop printing. The error status can be cleared by the **[PAUSE]** key, however, the display will return to the initial display "<1> DIAGNOSTIC Software Version No.". Printing is not automatically resumed after the error is cleared.*

2. Both label and tag paper can be used for printing.

■ **Sample Print A**

[Print Condition]

- Preset count : 1
- Print speed : 2”/sec.
- Sensor : No sensor
- Supply length : 76 mm (TS model)
  105 mm (HS model)
- Issuing mode : Batch printing

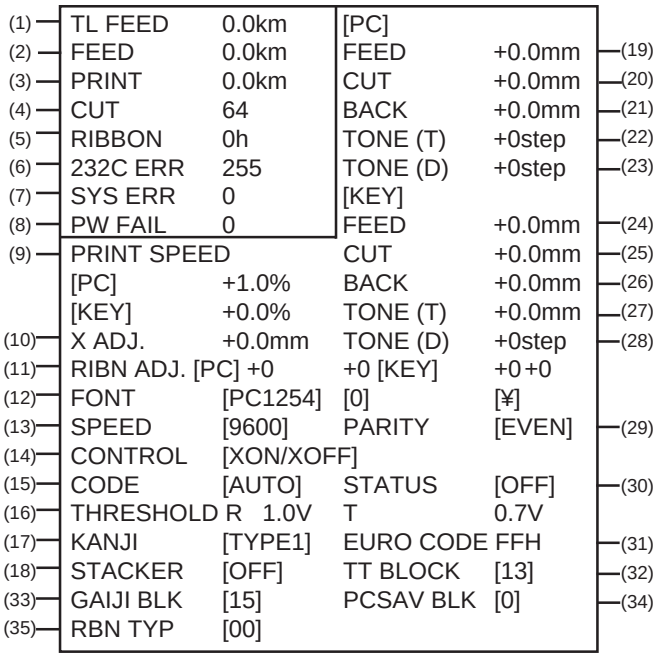

(1) TL FEED 0.0km
(2) FEED 0.0km
(3) PRINT 0.0km
(4) CUT 64
(5) RIBBON 0h
(6) 232C ERR 255
(7) SYS ERR 0
(8) PW FAIL 0
[PC]
FEED +0.0mm (19)
CUT +0.0mm (20)
BACK +0.0mm (21)
TONE (T) +0step (22)
TONE (D) +0step (23)
[KEY]
FEED +0.0mm (24)
CUT +0.0mm (25)
BACK +0.0mm (26)
TONE (T) +0.0mm (27)
TONE (D) +0step (28)
(9) PRINT SPEED
[PC] +1.0%
[KEY] +0.0%
(10) X ADJ. +0.0mm
(11) RIBN ADJ. [PC] +0 +0 [KEY] +0 +0
(12) FONT [PC1254] [0] [¥]
(13) SPEED [9600] PARITY [EVEN] (29)
(14) CONTROL [XON/XOFF]
(15) CODE [AUTO] STATUS [OFF] (30)
(16) THRESHOLD R 1.0V T 0.7V
(17) KANJI [TYPE1] EURO CODE FFH (31)
(18) STACKER [OFF] TT BLOCK [13] (32)
(33) GAIJI BLK [15] PCSAV BLK [0] (34)
(35) RBN TYP [00]

Fig. 6-1

1) Maintenance Counter

#	Item	Count Condition	Range
(1)	Total paper distance covered	Counted when the feed motor drives to feed, print and issue the paper. (Counted also during back feed.) [See NOTE 2].	0.0 to 3200.0 km
(2)	Paper distance covered		0.0 to 200.0 km
(3)	Print distance	Counted while printing. (Feeding and issuing paper, are not counted.) [See NOTE 2.]	0.0 to 200.0 km
(4)	Cut count	Counts every cut. [See NOTE 3.]	0 to 1000000 times
(5)	Ribbon motor drive time	Counted when the Ribbon motor is driven to feed, print, etc. [See NOTE 4.]	0 to 2000 hours
(6)	RS-232C hardware error count	Counted when a parity, overrun or framing error occurs. [See NOTE5.]	0 to 255 hours
(7)	System error count	Counted when a zero-dividing error occurs or undefined command is retrieved.	0 to 15 times
(8)	Momentary power failure count	Counted when a momentary power failure occurs.	0 to 15 times

NOTES:

1. *Item from (2) through (8) are initialized to “0” after RAM clear.*
2. *If the distance is 8.2 m or less (TS model)/4.1 m (HS model) or less, it is rounded down and no data is added to the memory at power off. If the distance is less than 0.5 km, “0.0 km” is printed.*
3. *If the count is 31 counts or less, it is rounded down and no data is added to the memory at power off.*
4. *If the driving time is 32 sec. or less, it is rounded down and no data is added to the memory at power off.*
5. *When a sent command results in an error, the same number as the data capacity of the command is counted by byte.*

2) Parameters

#	Item	Contents
(9)	Feed speed adjustment	-10.0 % to +10.0 %
(10)	X axis fine adjustment	-99.5 mm to +99.5 mm
(11)	Ribbon Motor Drive Voltage	-15 step to 0 step
(12)	Character code selection	PC-850 PC-851 PC-1252 LATIN9 PC-8 PC-855 PC-1253 ARABIC PC-852 PC-1250 PC-1254 PC-857 PC-1251 PC-1257
	Font zero selection	0: No slash used. Ø: Slash used.
	Code 5CH Selection	¥: ¥ \: \
(13)	Baud Rate	2400: 2400 BPS 4800: 4800 BPS 9600: 9600 BPS 19200: 19200 BPS
(14)	Transmission control mode	XON/XOFF: XON/XOFF READY/BUSY: READY/BUSY (DTR) XON+READY AUTO: XON+READY/BUSY XON/XOFF AUTO: XON/XOFF READY/BUSY RTS READY/BUSY (RTS)
(15)	Control Code Selection	AUTO: Automatic selection ESC LF NUL: ESC LF NUL mode {|}: Mainframe mode
(16)	Threshold Manual Fine (R) Adjustment for the Black Mark Sensor	0.0 V to 4.0 V
	Threshold Manual Fine (T) Adjustment for the Feed Gap Sensor	0.0 V to 4.0 V
(17)	Kanji Code Selection	TYPE1: Windows Code TYPE2: Original Code
(18)	Stacker Selection	ON: With Stacker OFF: Without Stacker
(19)	Feed Length Fine Adjustment (PC)	-10.0 mm to +10.0 mm (B-452-TS) -50.0 mm to +50.0 mm (B-452-HS)
(24)	Feed Length Fine Adjustment (KEY)	-10.0 mm to +10.0 mm
(20)	Cut/Strip Position Fine Adjustment (PC)	-10.0 mm to +10.0 mm (B-452-TS) -50.0 mm to +50.0 mm (B-452-HS)
(25)	Cut/Strip position Fine Adjustment (KEY)	-10.0 mm to +10.0 mm
(21) (26)	Back Feed Lenght Fine Adjustment (PC), (KEY)	-9.9 mm to +9.9 mm
(22) (27)	Print Tone Fine Adjustment (T) Thermal Transfer (PC), (KEY)	-10 step to +10 step
(23) (28)	Print Tone Fine Adjustment (D) Thermal Direct	-10 step to +10 step
(29)	Parity	None: None EVEN: Even
(30)	Strip Status	OFF: Strip wait status is not sent to PC ON: Strip wait status is sent to PC.
(31)	Euro Code	20 H to FF H
(32)	TT BLOCK	The number of blocks used for True type font: 0 to 15 (B-452-TS)/0 to 13 (B-452-HS)

#	Item	Contents
(33)	GAIJI BLOCK	The number of blocks used for Bitmap writable character: 0 to 15 (B-452-TS) / 0 to 13 (B-452-HS)
(34)	PCSAV BLOCK	The number of blocks used for PC Save: 0 to 15 (B-452-TS) / 0 to 13 (B-452-HS)
(35)	Ribbon type selection	Fixed to “00”.

■ Sample Print B

[Print Condition]

- Preset count : 1
- Print speed : 2”/sec.
- Sensor : No sensor
- Supply length : 76 mm (TS model)
  105 mm (HS model)
- Issuing mode : Batch printing

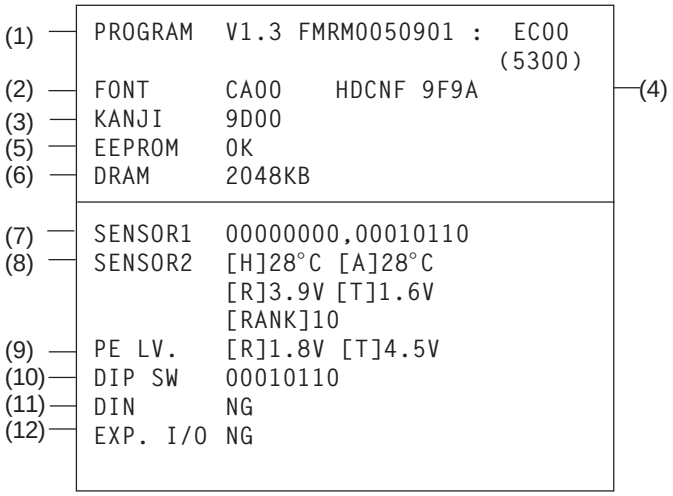
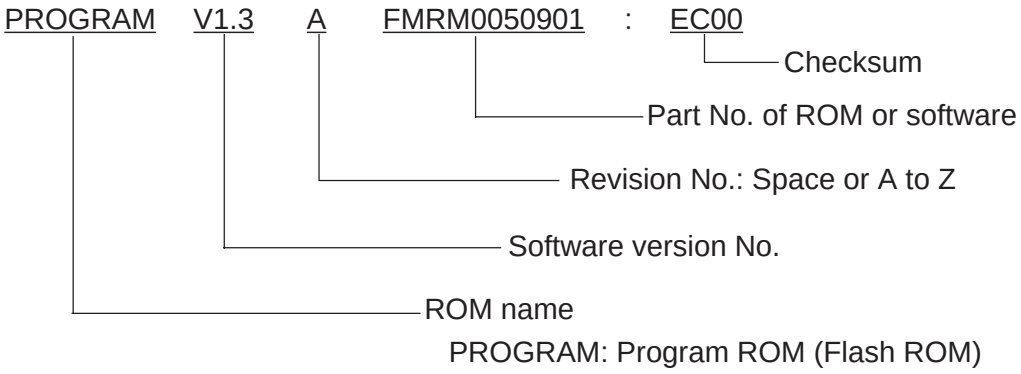


Fig. 6-2

(1) PROGRAM ROM Check


PROGRAM V1.3 A FMRM0050901 : EC00
Checksum
Part No. of ROM or software
Revision No.: Space or A to Z
Software version No.
ROM name
PROGRAM: Program ROM (Flash ROM)

NOTES: *1. Software version No., part No. of ROM and checksum vary according to the software version of PROGRAM ROM.*

2. The last two digits of the checksum are usually 0.

(2) FONT ROM Check

(3) KANJI ROM Check

NOTES: *1. Checksum varies according to the software version.*

2. When the KANJI ROM or KANJI OUTLINE ROM is not installed, the checksum becomes “0000”.

3. The last two digits of the checksum are not 0.

(4) HDCNF Check (B-452-HS model only)

HDCNF 9F9A
- 9F9A: Print Head Historical Control Configuration data

(5) EEPROM Check

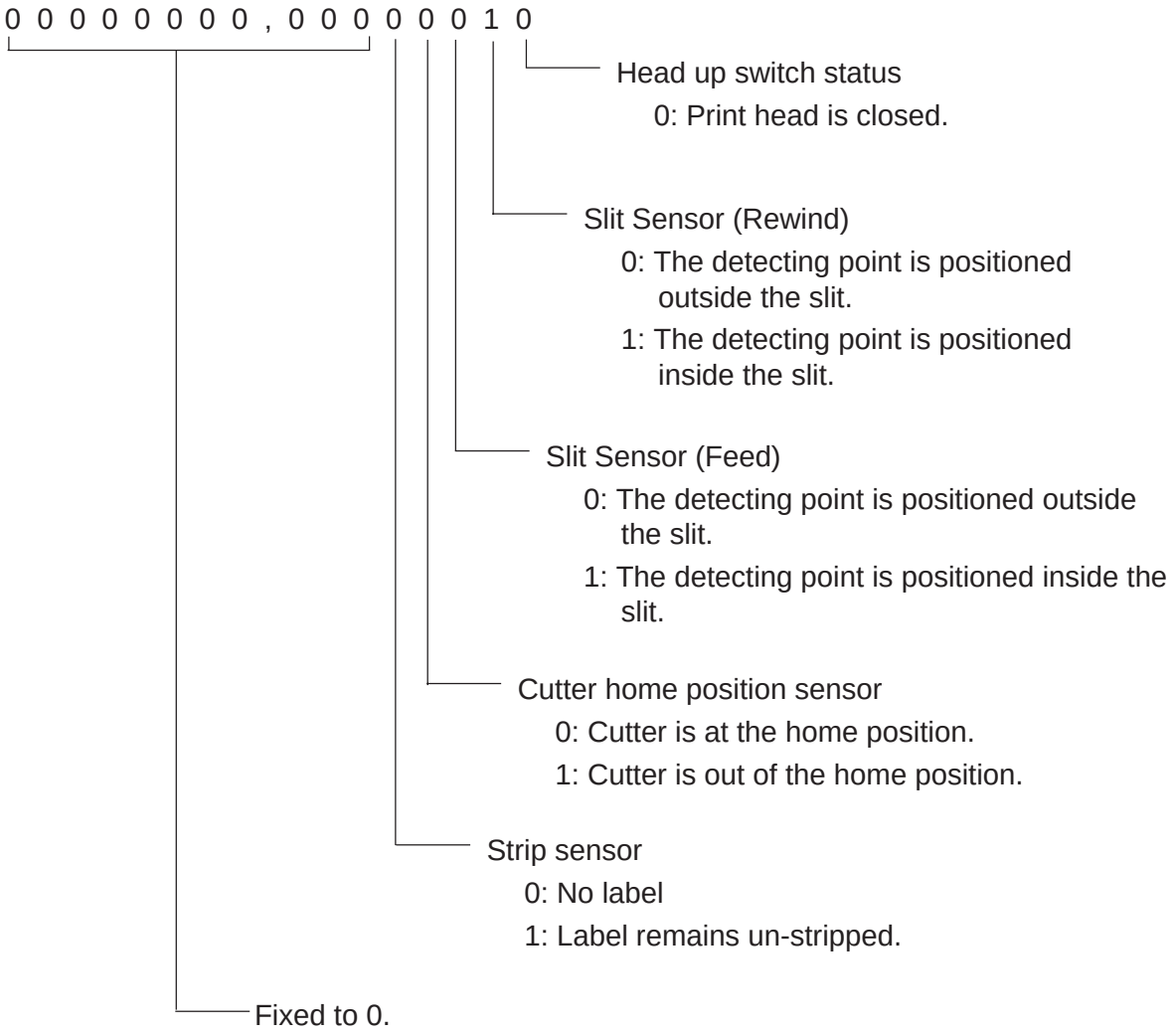
EEPROM OK
- OK: Read/write check
  - OK: Data in the check area can be properly read/written.
  - NG: Data in the check area cannot be properly read/written.
- EEPROM: Backup memory

(6) DRAM Check

DRAM 2048KB
- 2048KB: Readable/writable area
- DRAM: Image buffer memory or work memory

NOTE: *If an error is detected during DRAM check, the display of readable/writable area will stop when the error occurs.*

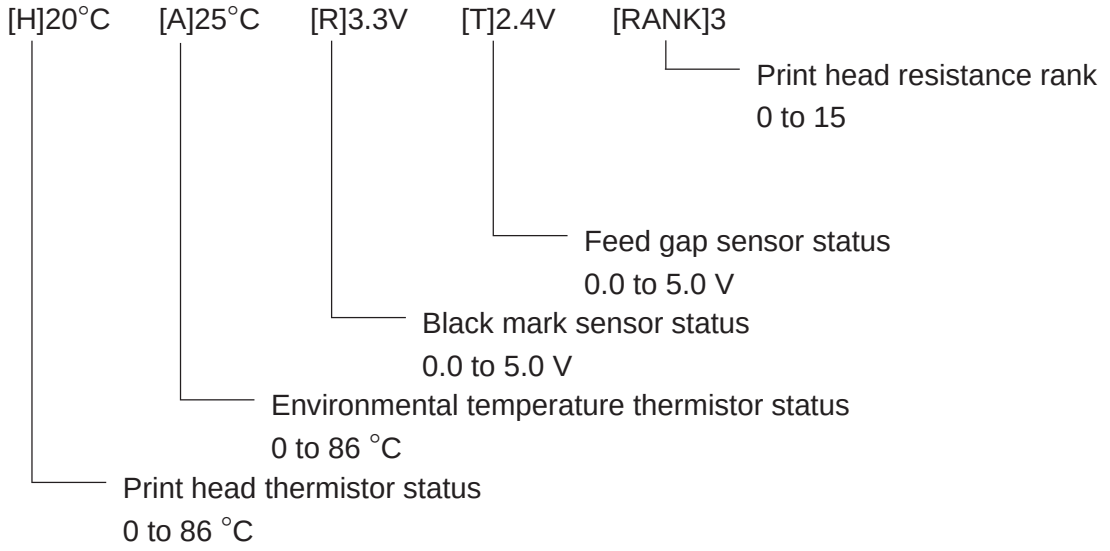
(7) Sensor 1 Check


0 0 0 0 0 0 0 0 , 0 0 0 0 0 0 1 0
Head up switch status
0: Print head is closed.
Slit Sensor (Rewind)
0: The detecting point is positioned outside the slit.
1: The detecting point is positioned inside the slit.
Slit Sensor (Feed)
0: The detecting point is positioned outside the slit.
1: The detecting point is positioned inside the slit.
Cutter home position sensor
0: Cutter is at the home position.
1: Cutter is out of the home position.
Strip sensor
0: No label
1: Label remains un-stripped.
Fixed to 0.

■ **Description of each sensor/switch**

Sensor/Switch	Description
Head up switch	Indicates whether the print head is closed.
Cutter home position switch	Indicates whether the cutter is at the home position or not.
Strip sensor	Indicates the existence of label in strip mode. When no label is detected (0), the subsequent label is issued, when a label is detected (1), the subsequent label will not be issued until the current label is removed.

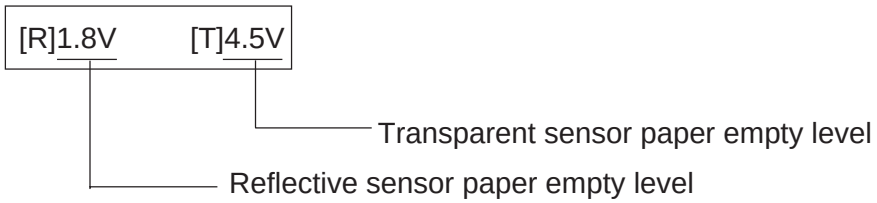
(8) SENSOR 2 Check



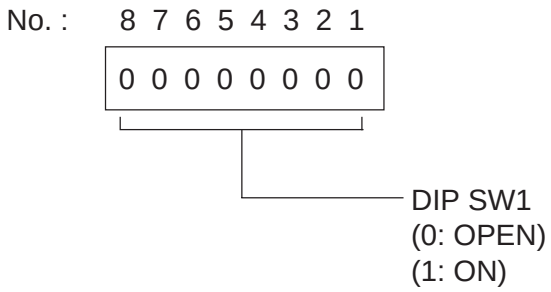
■ **Print head resistance rank**

Resistance Rank	Average resistance (Ω)	
	B-452-TS model	B-452-HS model
0	1731 to 1759	1584 to 1611
1	1703 to 1730	1612 to 1638
2	1674 to 1702	1639 to 1665
3	1645 to 1673	1666 to 1692
4	1617 to 1644	1693 to 1719
5	1588 to 1616	1720 to 1746
6	1559 to 1587	1747 to 1773
7	1531 to 1558	1774 to 1800
8	1502 to 1530	1801 to 1827
9	1473 to 1501	1828 to 1854
10	1444 to 1472	1855 to 1881
11	1416 to 1443	1882 to 1908
12	1387 to 1415	1909 to 1935
13	1358 to 1386	1936 to 1962
14	1330 to 1357	1963 to 1989
15	1301 to 1329	1990 to 2016

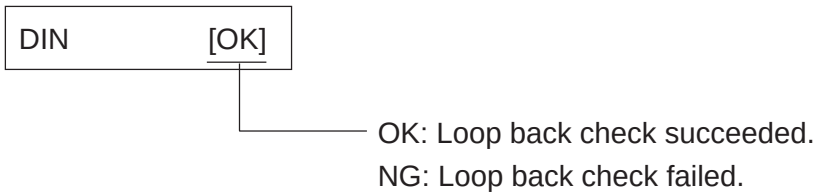
(9) Paper Empty Level Check



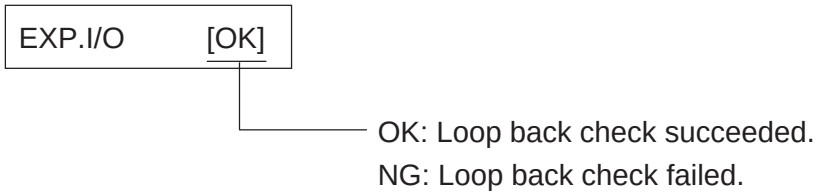
(10) DIP SW Check



(11) Loop back check with the DIN cable

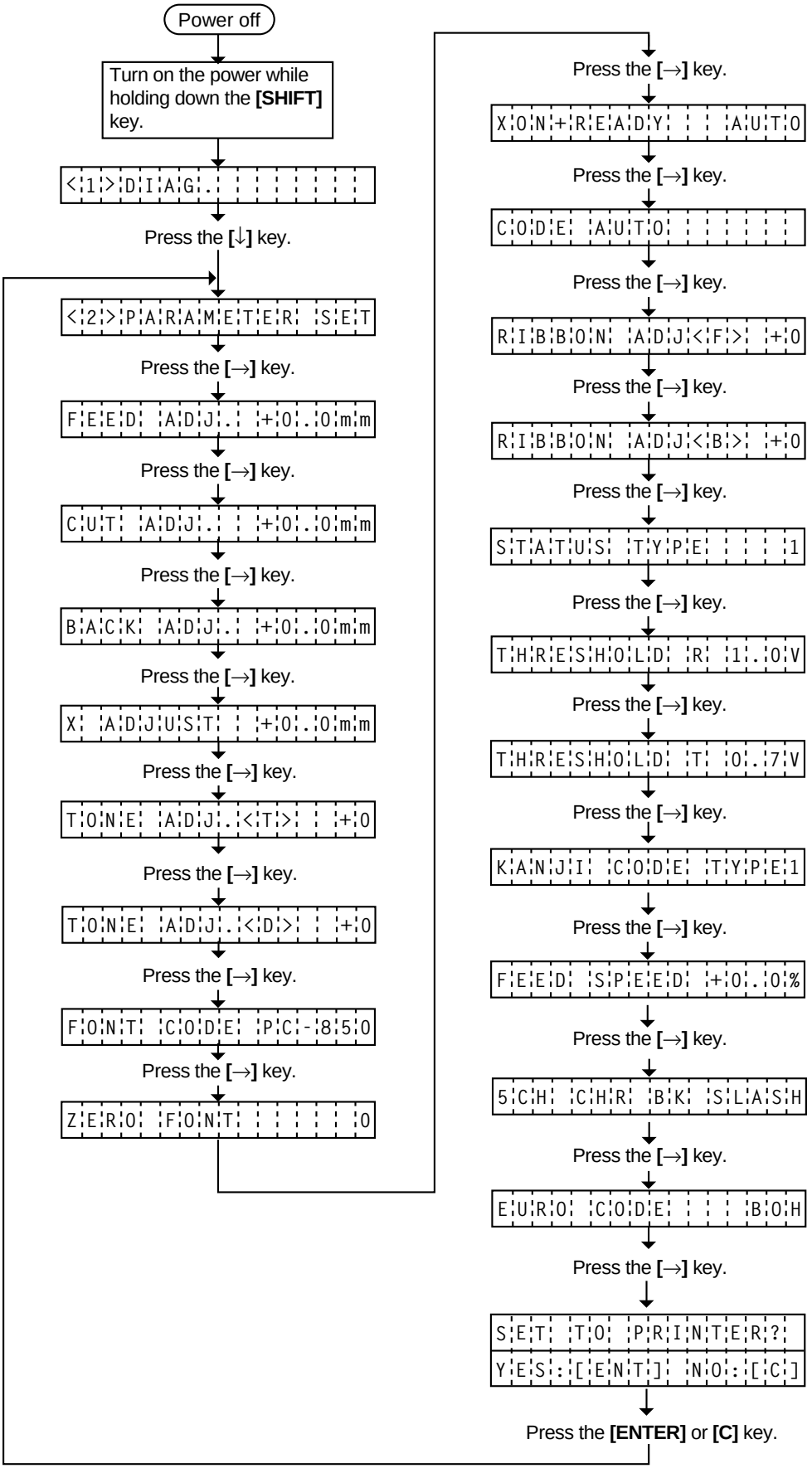


(12) Loop back check with the Expansion I/O



6.3 PARAMETER SETTING MODE (When using the KB-80-QM Optional Keyboard)

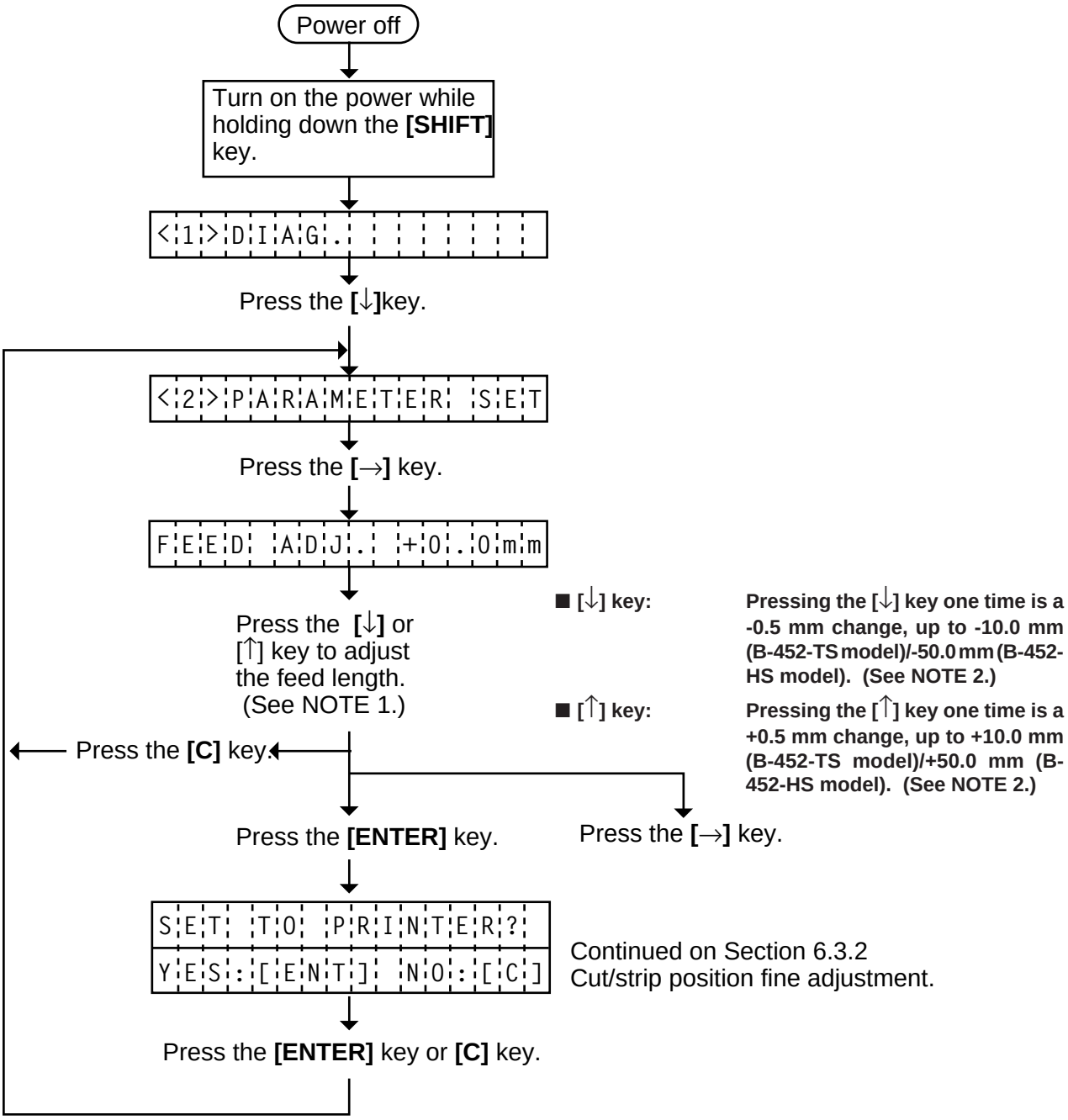
The following 19 items are set in the parameter setting mode. The values set in this mode are printed on the sample print of the maintenance counter. Setting procedure and functions are provided below.



■ Parameter Setting Mode Table

Mode Name	Function
FEED ADJ.	Using this parameter the feed length is fine adjusted.
CUT ADJ.	Using this parameter the cut position or strip position is fine adjusted.
BACK ADJ.	Using this parameter the back feed length from the cut/strip position to the home position is fine adjusted.
X ADJUST	This setting is used to finely adjust print position in the X axis.
TONE ADJ. <T>	Using this parameter the print tone is fine adjusted at the thermal transfer printing. The longer the print pulse width, the darker the print tone becomes. The shorter, the lighter the print tone becomes.
TONE ADJ. <D>	Using this parameter the print tone is fine adjusted at the thermal direct printing. The longer the print pulse width, the darker the print tone becomes. The shorter, the lighter the print tone becomes.
FONT CODE	The character code is selected from. PC-8, PC-850, PC-851, PC-852, PC-855, PC-857, PC-1250, PC-1251, PC-1252, PC-1253, PC-1254, PC-1257, ARABIC, LATAIN9
ZERO FONT	The font zero either 0 or ø is selected.
XON+READY	Transmission control mode of the serial interface is selected.
CODE	The command code out of AUTO, ESC/LF/NUL, or {¦} is selected.
RIBBON ADJ. <F>	Using this parameter the ribbon motor voltage (take-up side) is fine adjusted.
RIBBON ADJ. <B>	Using this parameter the ribbon motor voltage (feed side) is fine adjusted.
STATUS TYPE	Whether or not the strip wait status (05H) is sent in response to the status request command from the PC is selectable.
THRESHOLD R	The threshold of the black mark sensor is manually fine adjusted.
THRESHOLD T	The threshold of the feed gap sensor is manually fine adjusted.
KANJI CODE	Unavailable
FEED SPEED	Feed speed is adjusted to prevent shrunk printing.
EURO CODE	The EURO font code is selected.
5CH CHR	Character Code 5CH is set to ¥ (YEN) or \ (back slash)

6.3.1 Feed Length Fine Adjustment

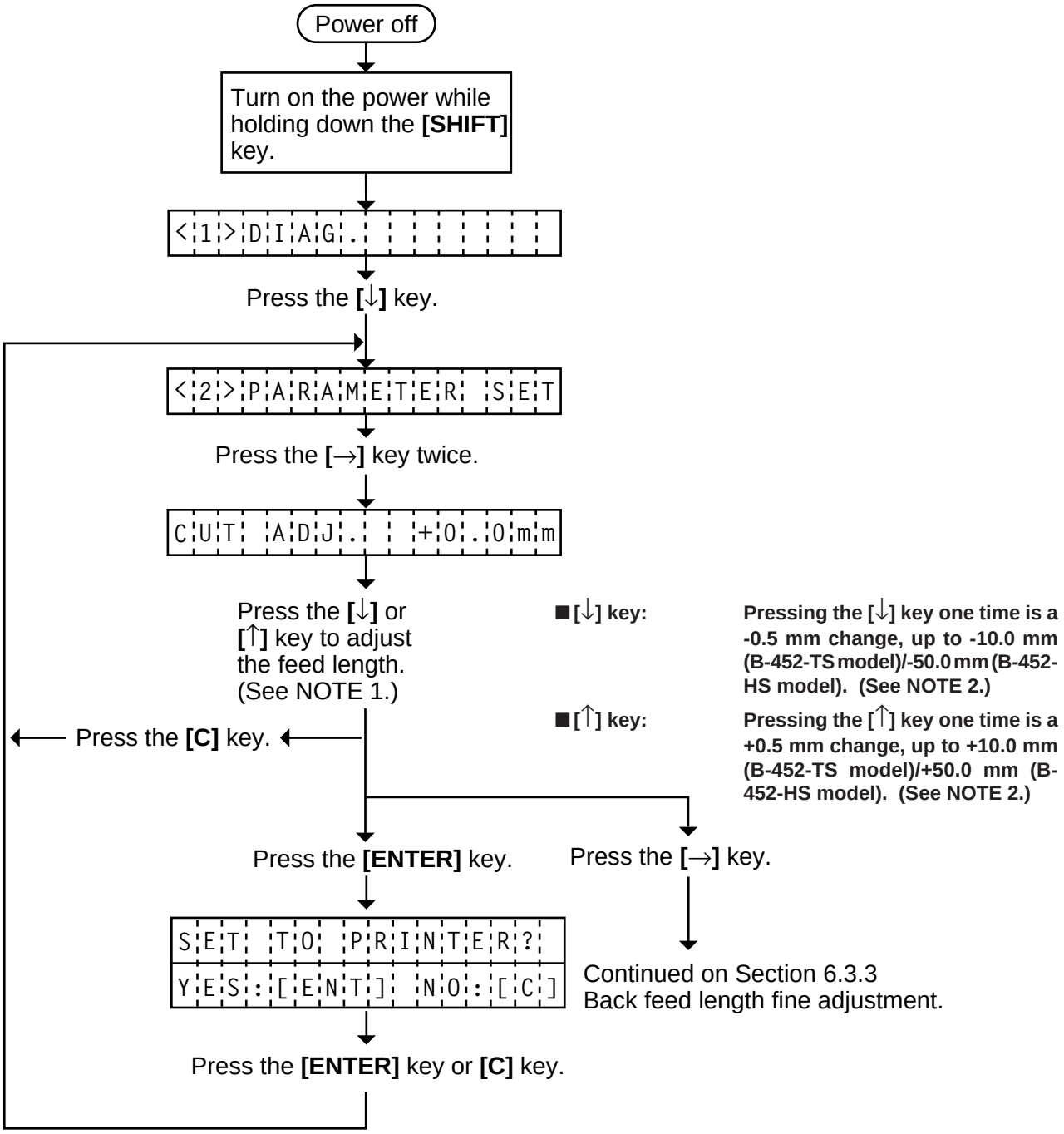

Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓]key.
<2>PARAMETER SET
Press the [→] key.
FEED ADJ.: +0.0mm
Press the [↓] or [↑] key to adjust the feed length. (See NOTE 1.)
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Continued on Section 6.3.2 Cut/strip position fine adjustment.
Press the [ENTER] key or [C] key.
■ [↓] key:
Pressing the [↓] key one time is a -0.5 mm change, up to -10.0 mm (B-452-TS model)/-50.0 mm (B-452-HS model). (See NOTE 2.)
■ [↑] key:
Pressing the [↑] key one time is a +0.5 mm change, up to +10.0 mm (B-452-TS model)/+50.0 mm (B-452-HS model). (See NOTE 2.)

NOTES: *1. Holding the **[↓]** key or **[↑]** key down for more than 0.5 seconds enables a fast forward.*

2. Max. fine adjustment ±10.0 mm (B-452-TS)/±50.0 mm (B-452-HS) = Key fine adjustment value (± 10.0 mm) + PC fine adjustment value (B-450-TS: ± 10.0 mm/ B452-HS: ±50.0 mm)
When the value reaches the maximum, the value remains unchanged even if the subsequent fine adjustment is performed.

*3. A change feed value is stored in keyboard memory by pressing the **[→]** key.*

6.3.2 Cut/Strip Position Fine Adjustment


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key twice.
CUT ADJ. +0.0mm
Press the [↓] or [↑] key to adjust the feed length. (See NOTE 1.)
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Press the [ENTER] key or [C] key.
■[↓] key:
Pressing the [↓] key one time is a -0.5 mm change, up to -10.0 mm (B-452-TS model)/-50.0 mm (B-452-HS model). (See NOTE 2.)
■[↑] key:
Pressing the [↑] key one time is a +0.5 mm change, up to +10.0 mm (B-452-TS model)/+50.0 mm (B-452-HS model). (See NOTE 2.)
Continued on Section 6.3.3
Back feed length fine adjustment.

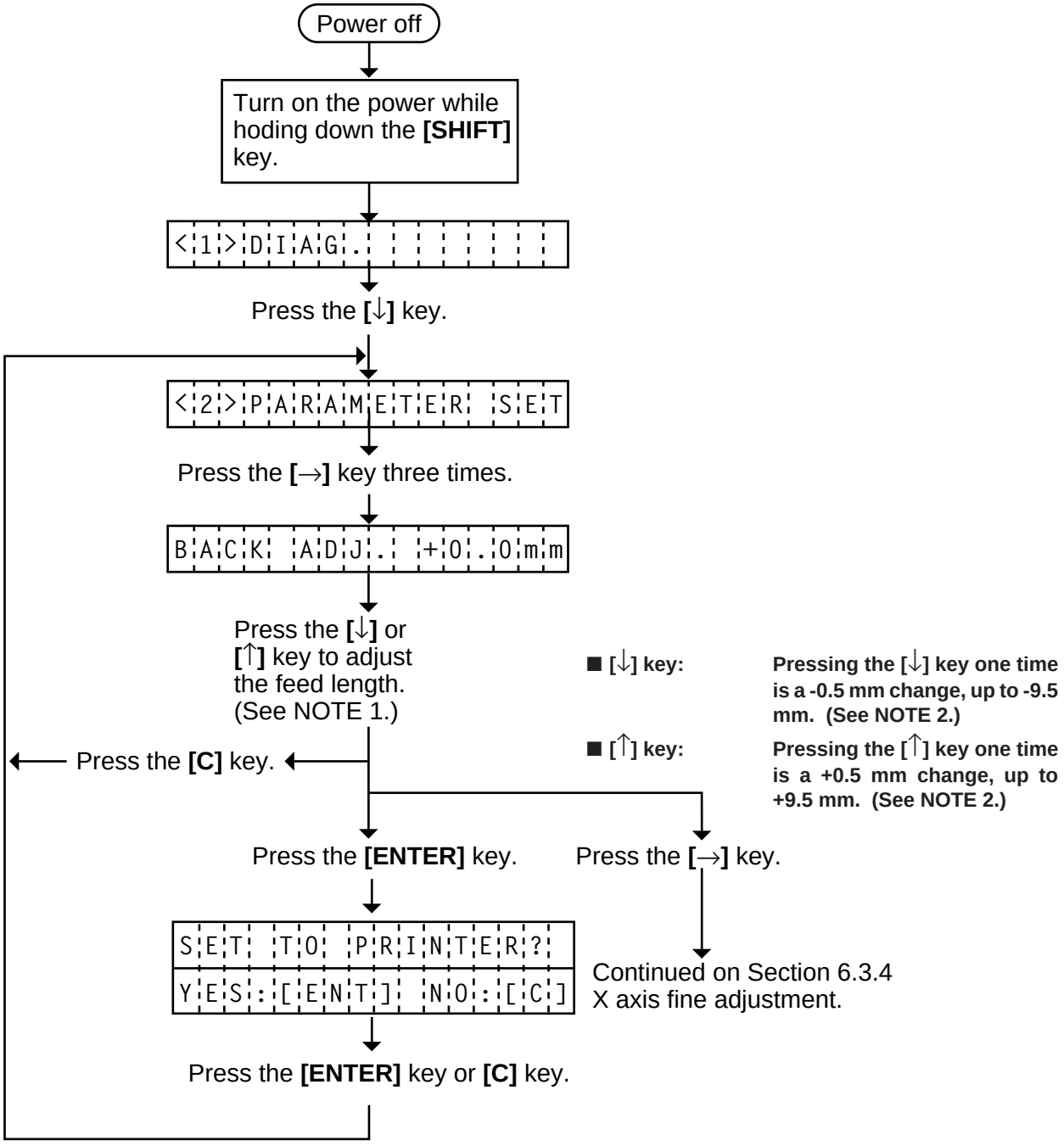
NOTES: *1. Holding the **[↓]** key or **[↑]** key down for more than 0.5 seconds enables a fast forward.*

2. Max. fine adjustment ±10.0 mm (B-452-TS)/±50.0 mm (B-452-HS) = Key fine adjustment value (±10.0 mm) + PC fine adjustment value (± 10.0 mm: B-452-TS/ ±50.0 mm: B-452-HS)
When the value reaches the maximum, the value remains unchanged even if a subsequent fine adjustment is performed.

*3. A changed cut/strip position value is stored in keyboard memory by pressing the **[→]** key.*

4. When using label with length of less than 33 mm, calculate the cut position fine adjustment value using the expression provided on page 6-17.

6.3.3 Back Feed Length Fine Adjustment


Power off
Turn on the power while hoding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key three times.
BACK ADJ. +0.0mm
Press the [↓] or [↑] key to adjust the feed length. (See NOTE 1.)
Press the [C] key.
■ [↓] key:
Pressing the [↓] key one time is a -0.5 mm change, up to -9.5 mm. (See NOTE 2.)
■ [↑] key:
Pressing the [↑] key one time is a +0.5 mm change, up to +9.5 mm. (See NOTE 2.)
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Continued on Section 6.3.4 X axis fine adjustment.
Press the [ENTER] key or [C] key.

NOTES: *1. Holding the **[↓]** key or **[↑]** key down for more than 0.5 seconds enables a fast forward.*

2. Max. fine adjustment ±9.9 mm = Key fine adjustment value (± 9.5 mm) + PC fine adjustment value (±9.9 mm)

When the value reaches the maximum, the value remains unchanged even if the subsequent fine adjustment is performed.

*3. A changed back feed value is stored in keyboard memory by pressing the **[→]** key.*

■ Feed Length Fine Adjustment Example

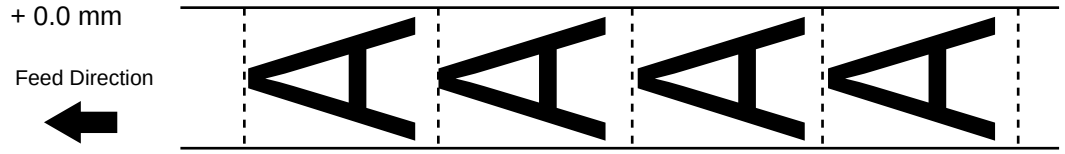


Fig. 6-3

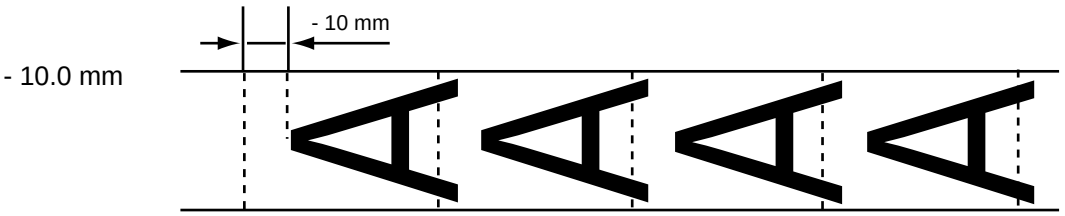


Fig. 6-4

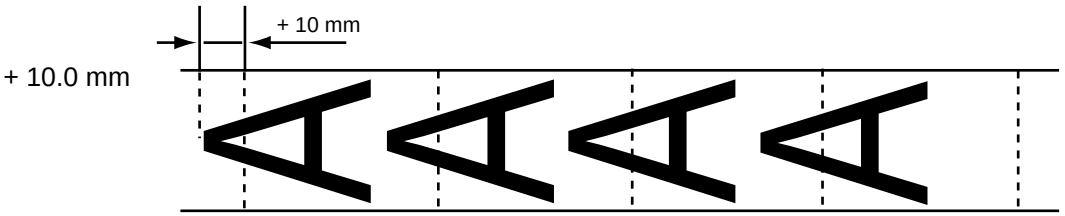


Fig. 6-5

■ Cut Position Fine Adjustment Example

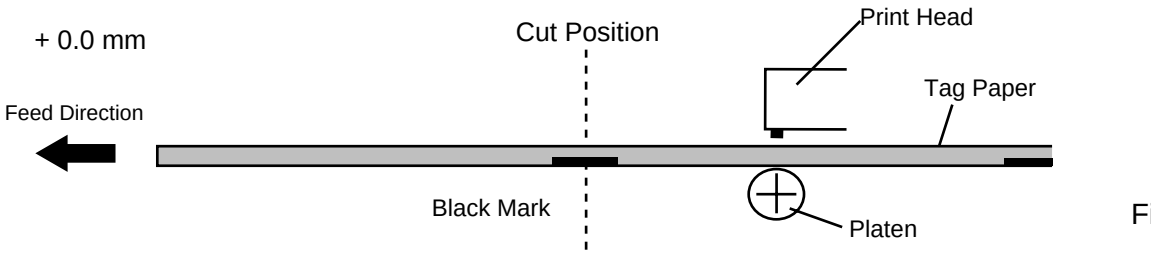


Fig. 6-6

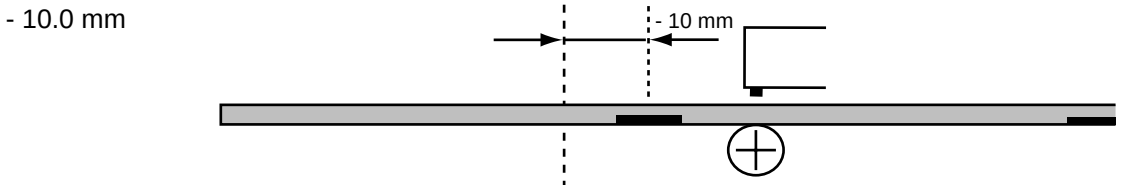


Fig. 6-7

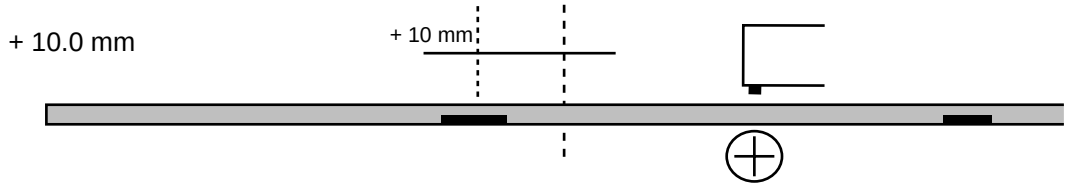


Fig. 6-8

■ **When using a label with a length of less than 33 mm :**

Case 1

Condition: Issue command [ESC]XS, feed command [ESC]T and eject command [ESC]IB are received.
Label pitch: 33.0 mm or less, with cut, feed gap sensor, cut position fine adjustment value ± 10 mm or less, and issue mode set to C (cut). When the above conditions are all met, the issue operation in cut issue mode is as follows:

(1) Head lifted → (2) Forward feed to the cut position → (3) Head lowered → (4) Cut → (5) Head lifted → (6) Backfeed to the home position → (7) Head lowered.

Case 2

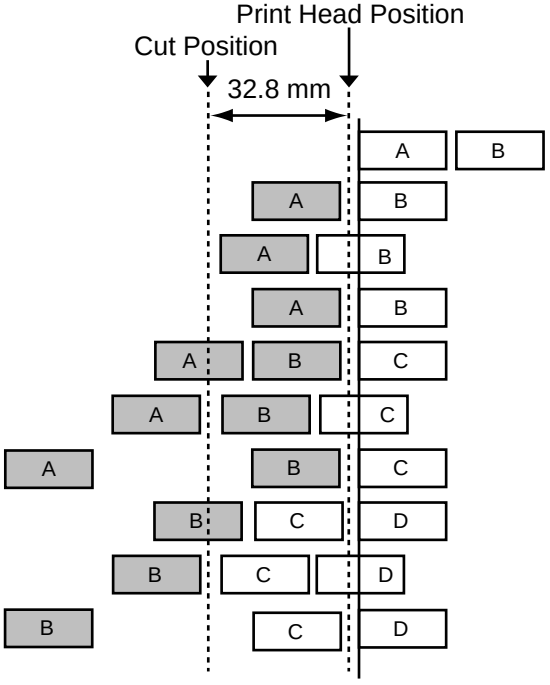
Generally the minimum label length which is available in cut mode is 33.0 mm. When using a label with a length of less than 33 mm, the edge of the label may be caught on the print head during back feed to the print start position after cutting the label gap, causing a improper print start position.
In this case set the cut position fine adjustment value after calculating the value using the following formula so that the unprinted label returns to the correct print start position.
However, use of this method will leave one or two printed label(s) between the print head and the cutter. Feed or print the label(s) to remove them.

(a) Formula for cut position fine adjustment value
Cut position fine adjustment value
= (the number of labels left between the print head and the cutter) x (span of label)
= (32.8 mm/label length) x (span of label)

* Omit the decimals of the value obtained by dividing 32.8 mm by the label length for one unit.

(example) Span of label : 30.0 mm, Label length: 24.0 mm
(32.8 mm/30.0 mm) x 30.0 mm = 1 x 30.0 mm = +30.0 mm

(b) Example



(1) Idling
(2) Printing the first label A is completed.
(3) Label A is fed to the cut position and the front gap is cut.
(4) Label B is fed in the reverse direction to the print start position.
(5) Printing the second label B is completed.
(6) Label B is fed to the cut position and the front gap is cut.
(7) Label C is fed in the reverse direction to the print start position.
(8) To take away label B, label C is fed.
(9) Label B is fed to the cut position and the front gap is cut.
(10) Label D is fed in the reverse direction to the print start position.

Fig. 6-9

■ Strip Position Fine Adjustment Example

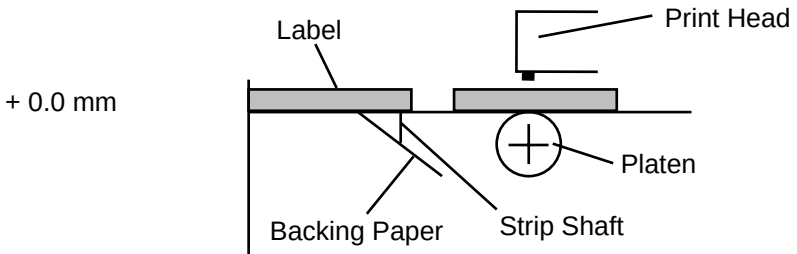


Fig. 6-10

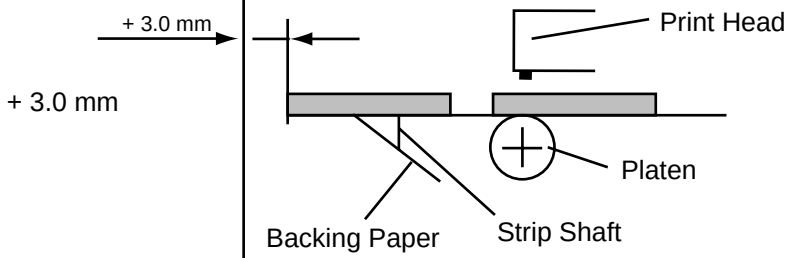


Fig. 6-11

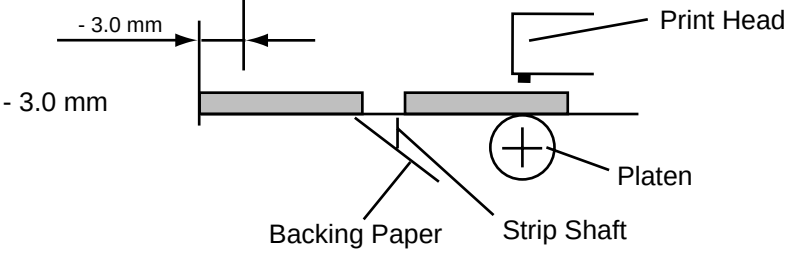


Fig. 6-12

NOTE: *The print stop position when printing the label in strip mode varies according to label length as the strip mode printing stops so that the edge of the strip shaft is 4 mm from the middle of the gap. This is because the gap length is programmed as 2mm. When the gap length is 5 mm or more, the effective print length should be set to the value obtained by subtracting 2 mm from the label pitch, that is, set the gap length to 2 mm. If the print format hangs over the gap as a result, correct the print start position. If the print stop position is improper, refer to Section 6.3.2 and make a fine adjustment.*

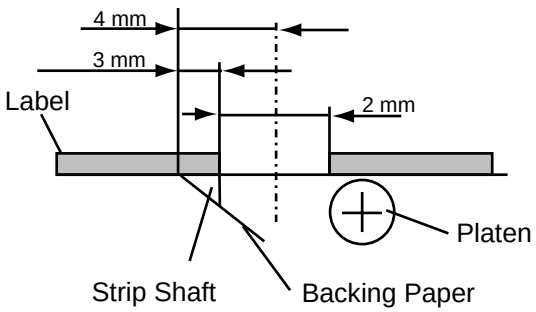


Fig. 6-13

■ Back Feed Length Fine Adjustment Example

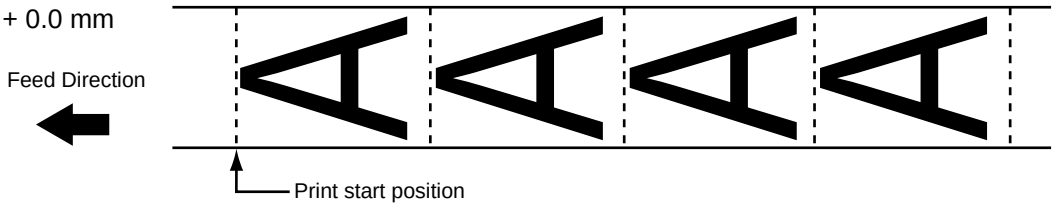


Fig. 6-14

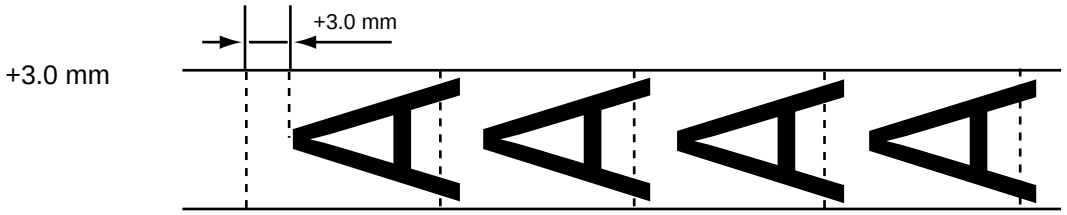


Fig. 6-15

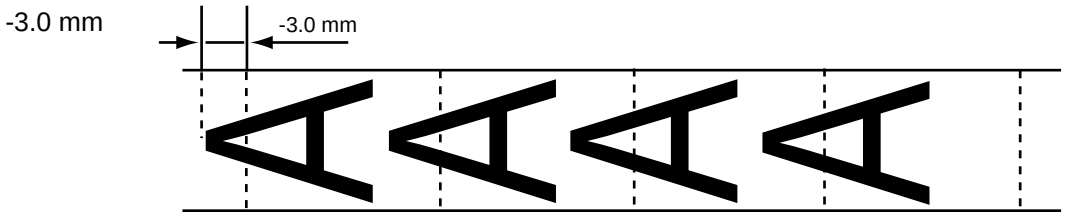
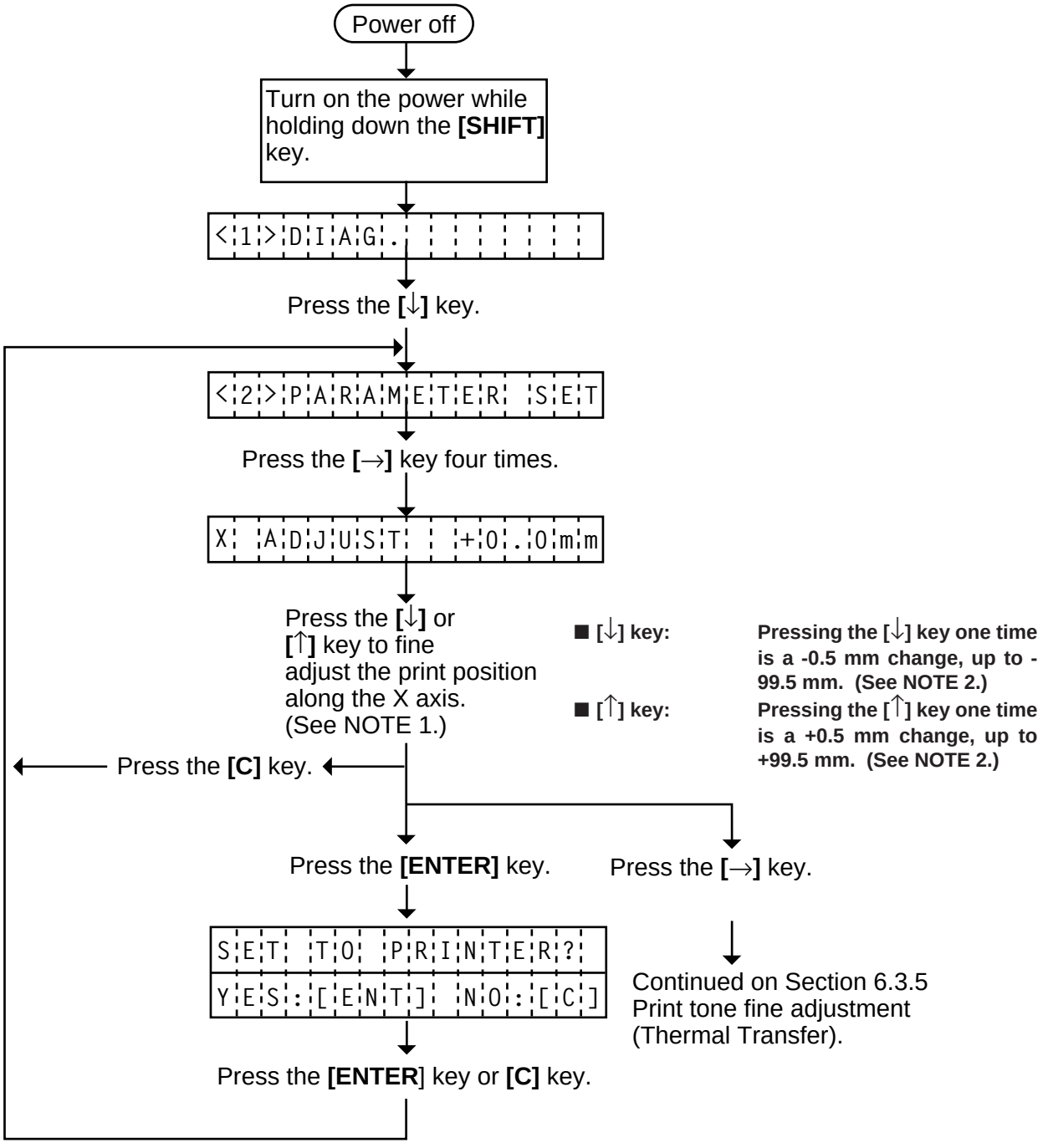


Fig. 6-16

6.3.4 X Axis Fine Adjustment


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key four times.
X ADJUST +0.0mm
Press the [↓] or [↑] key to fine adjust the print position along the X axis. (See NOTE 1.)
■ [↓] key:
Pressing the [↓] key one time is a -0.5 mm change, up to -99.5 mm. (See NOTE 2.)
■ [↑] key:
Pressing the [↑] key one time is a +0.5 mm change, up to +99.5 mm. (See NOTE 2.)
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Continued on Section 6.3.5 Print tone fine adjustment (Thermal Transfer).
Press the [ENTER] key or [C] key.

NOTES: *1. Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*

2. Max. fine adjustment ± 99.5 mm = X axis value

When the value reaches the maximum, the value remains unchanged even if the subsequent fine adjustment is performed.

3. A changed X axis is stored in keyboard memory by pressing the [→] key.

■ X Axis Fine Adjustment Example

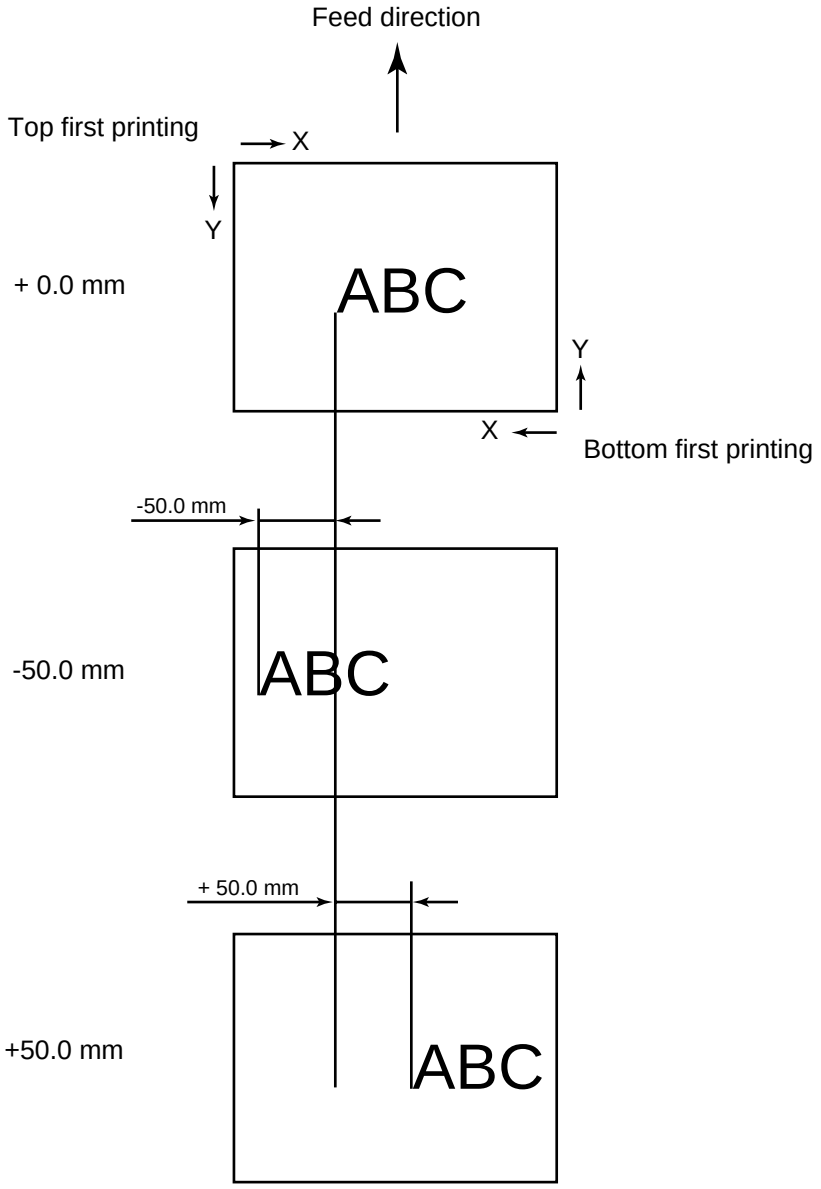


Fig. 6-17

Fig. 6-18

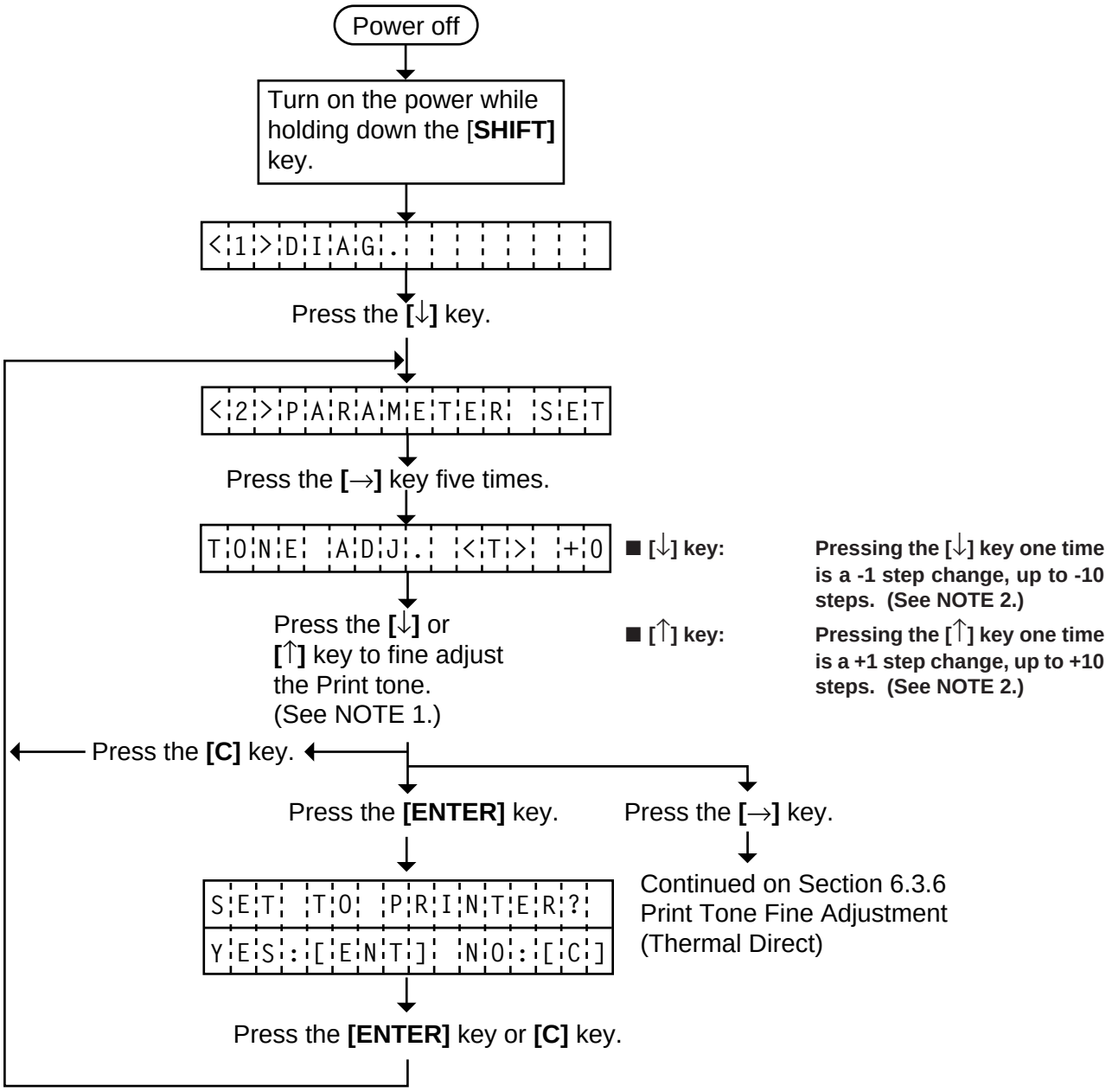
Fig. 6-19

NOTES: *1. The X axis fine adjustment is performed to fine adjust the X axis of the drawing in the left or right direction.*

2. Adjust the X axis in the effective print range. (After the value reaches the coordinate "0", the value remains unchanged even if the subsequent fine adjustment is performed in the negative direction.)

3. X axis fine adjustment cannot be used in self test mode or test printing.

6.3.5 Print Tone Fine Adjustment (Thermal Transfer Print)


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key five times.
TONE ADJ. <T> +0
Press the [↓] or [↑] key to fine adjust the Print tone. (See NOTE 1.)
■ [↓] key:
Pressing the [↓] key one time is a -1 step change, up to -10 steps. (See NOTE 2.)
■ [↑] key:
Pressing the [↑] key one time is a +1 step change, up to +10 steps. (See NOTE 2.)
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Continued on Section 6.3.6 Print Tone Fine Adjustment (Thermal Direct)
Press the [ENTER] key or [C] key.

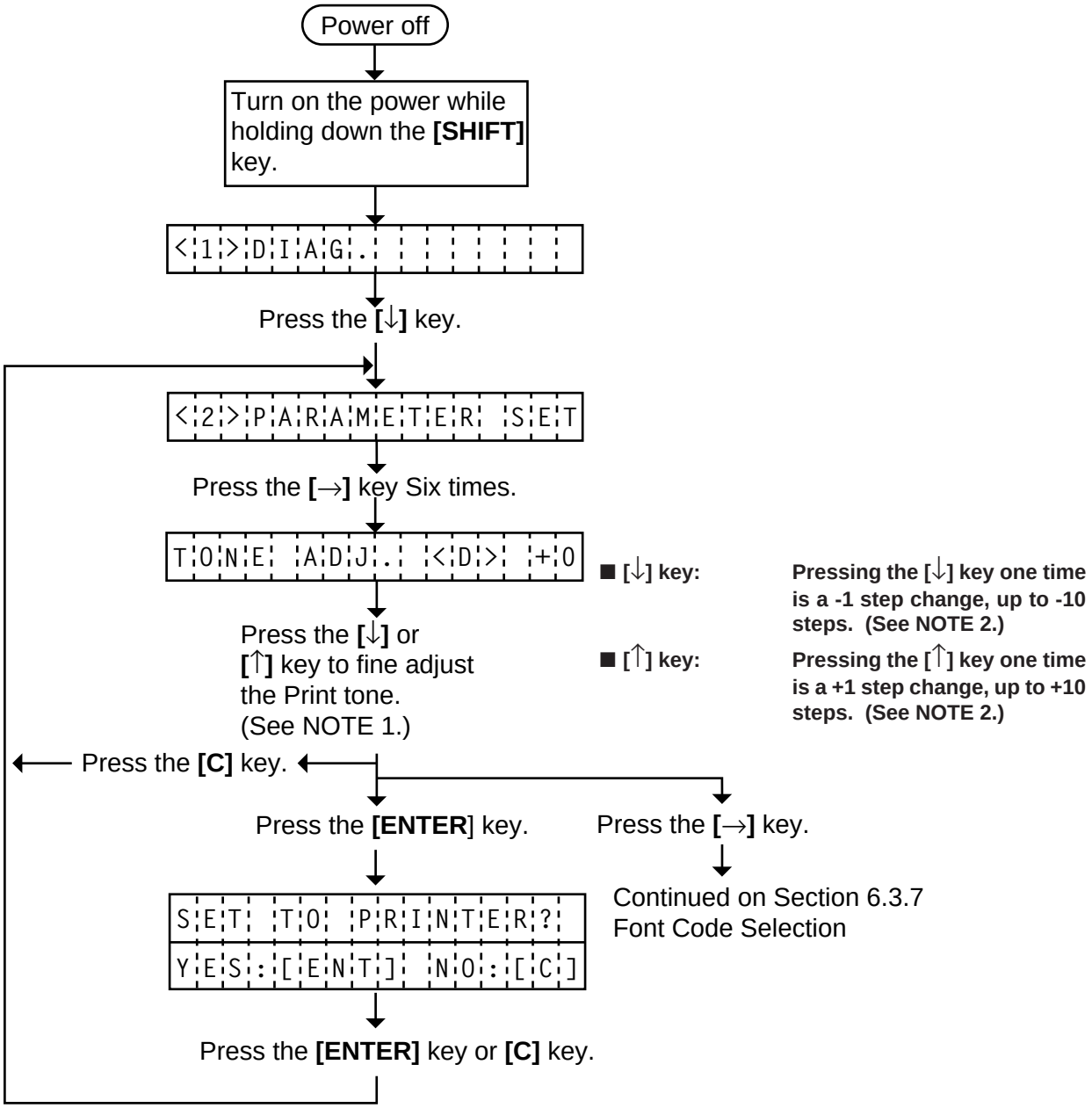
NOTES: *1 Holding the **[↓]** key or **[↑]** key down for more than 0.5 seconds enables a fast forward.*

2. Max. fine adjustment ± 10 steps = key fine adjustment value (± 10 steps) + PC fine adjustment value (± 10 steps)

When the value reaches the maximum, the value remains unchanged even if the subsequent fine adjustment is performed.

*3. A changed print tone value is stored in keyboard memory by pressing the **[→]** key.*

6.3.6 Print Tone Fine Adjustment (Thermal Direct Print)


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key Six times.
TONE ADJ. <D> +0
Press the [↓] or [↑] key to fine adjust the Print tone. (See NOTE 1.)
■ [↓] key:
Pressing the [↓] key one time is a -1 step change, up to -10 steps. (See NOTE 2.)
■ [↑] key:
Pressing the [↑] key one time is a +1 step change, up to +10 steps. (See NOTE 2.)
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Continued on Section 6.3.7 Font Code Selection
Press the [ENTER] key or [C] key.

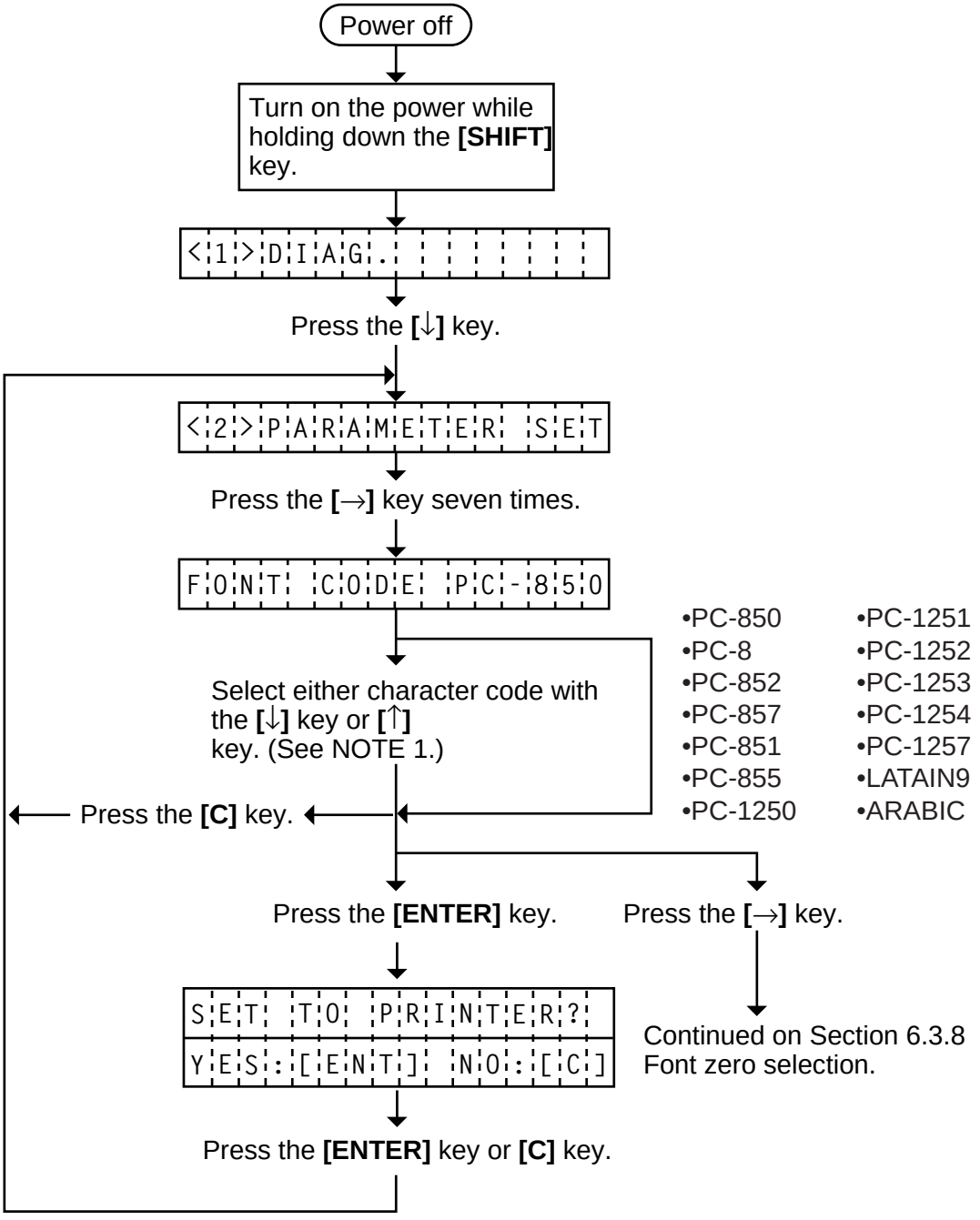
NOTES: *1 Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*

2. Max. fine adjustment ± 10 steps = key fine adjustment value (± 10 steps) + PC fine adjustment value (± 10 steps)

When the value reaches the maximum, the value remains unchanged even if the subsequent fine adjustment is performed.

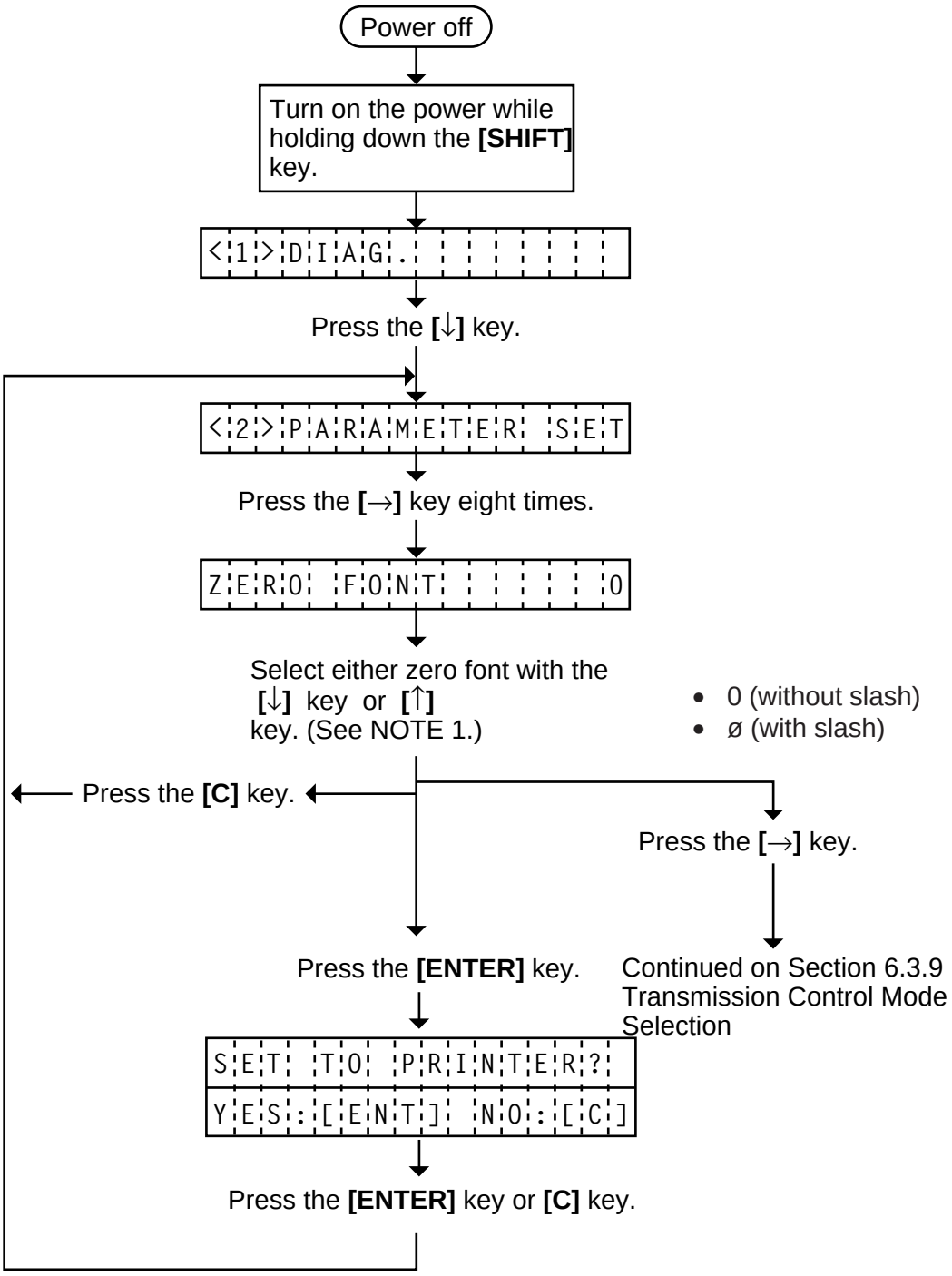
3. A changed print tone value is stored in keyboard memory by pressing the [→] key.

6.3.7 Font Code Selection



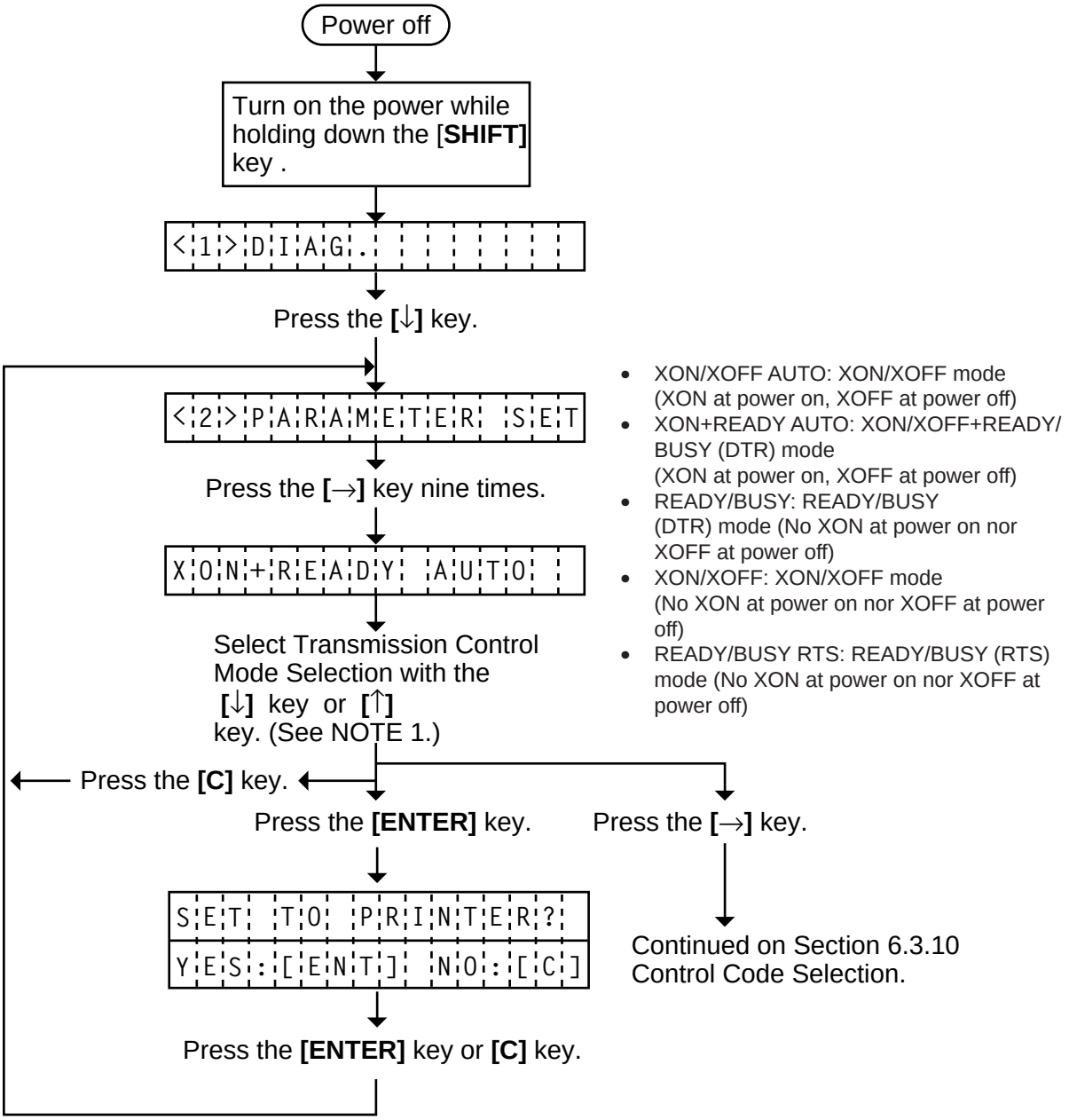
NOTES: *1. Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*
2. A changed font code is stored in keyboard memory by pressing the [→] key.

6.3.8 Font Zero Selection


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key eight times.
ZERO FONT 0
Select either zero font with the [↓] key or [↑] key. (See NOTE 1.)
• 0 (without slash)
• ø (with slash)
Press the [C] key.
Press the [→] key.
Press the [ENTER] key.
Continued on Section 6.3.9 Transmission Control Mode Selection
SET TO PRINTER?
YES:[ENT] NO:[C]
Press the [ENTER] key or [C] key.

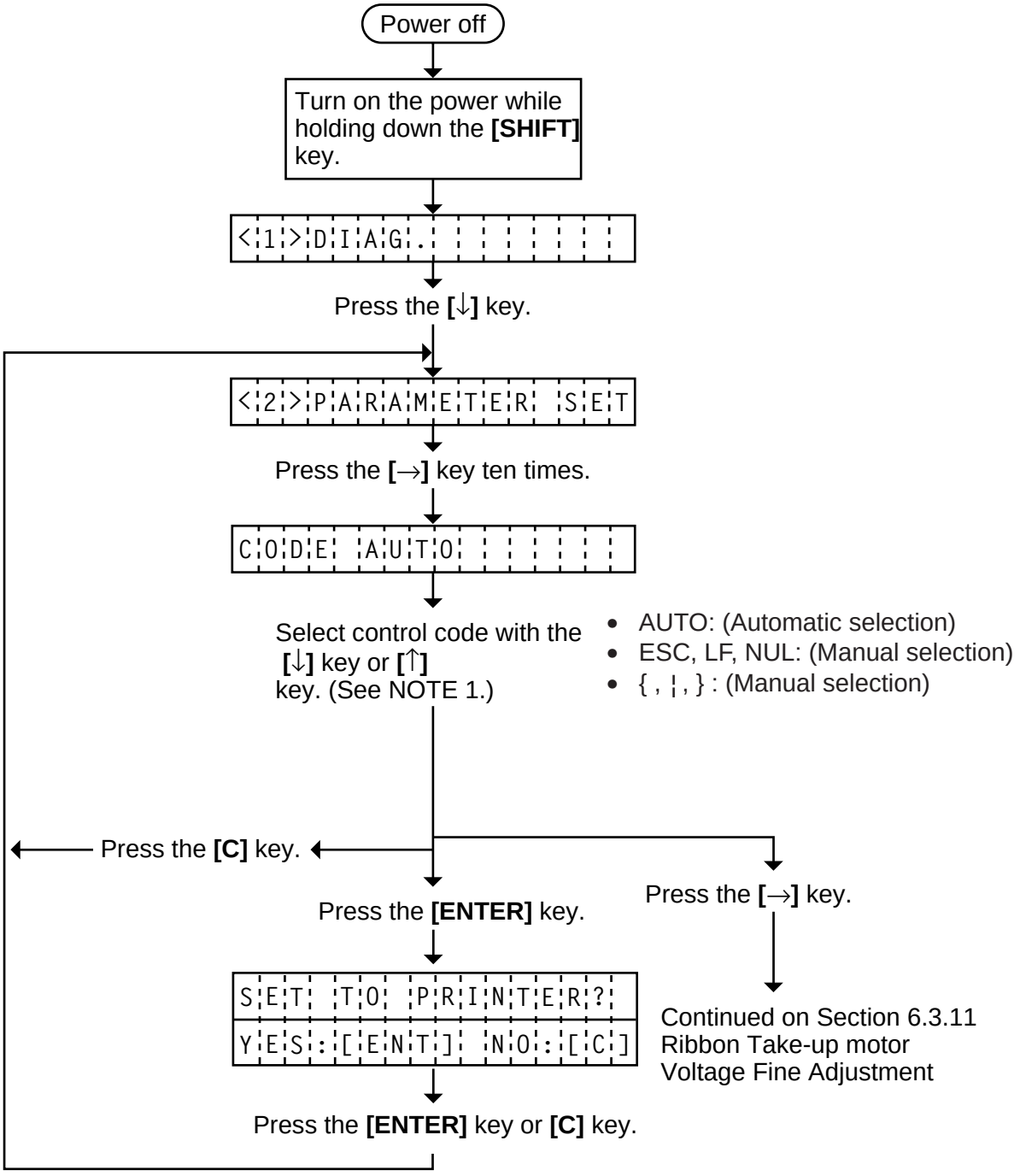
NOTES: *1. Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*
2. A changed zero font is stored in keyboard memory by pressing the [→] key.

6.3.9 Transmission Control Mode Selection


Power off
Turn on the power while holding down the [SHIFT] key .
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key nine times.
XON+READY AUTO
Select Transmission Control Mode Selection with the [↓] key or [↑] key. (See NOTE 1.)
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Press the [ENTER] key or [C] key.
Continued on Section 6.3.10 Control Code Selection.
• XON/XOFF AUTO: XON/XOFF mode (XON at power on, XOFF at power off)
• XON+READY AUTO: XON/XOFF+READY/BUSY (DTR) mode (XON at power on, XOFF at power off)
• READY/BUSY: READY/BUSY (DTR) mode (No XON at power on nor XOFF at power off)
• XON/XOFF: XON/XOFF mode (No XON at power on nor XOFF at power off)
• READY/BUSY RTS: READY/BUSY (RTS) mode (No XON at power on nor XOFF at power off)

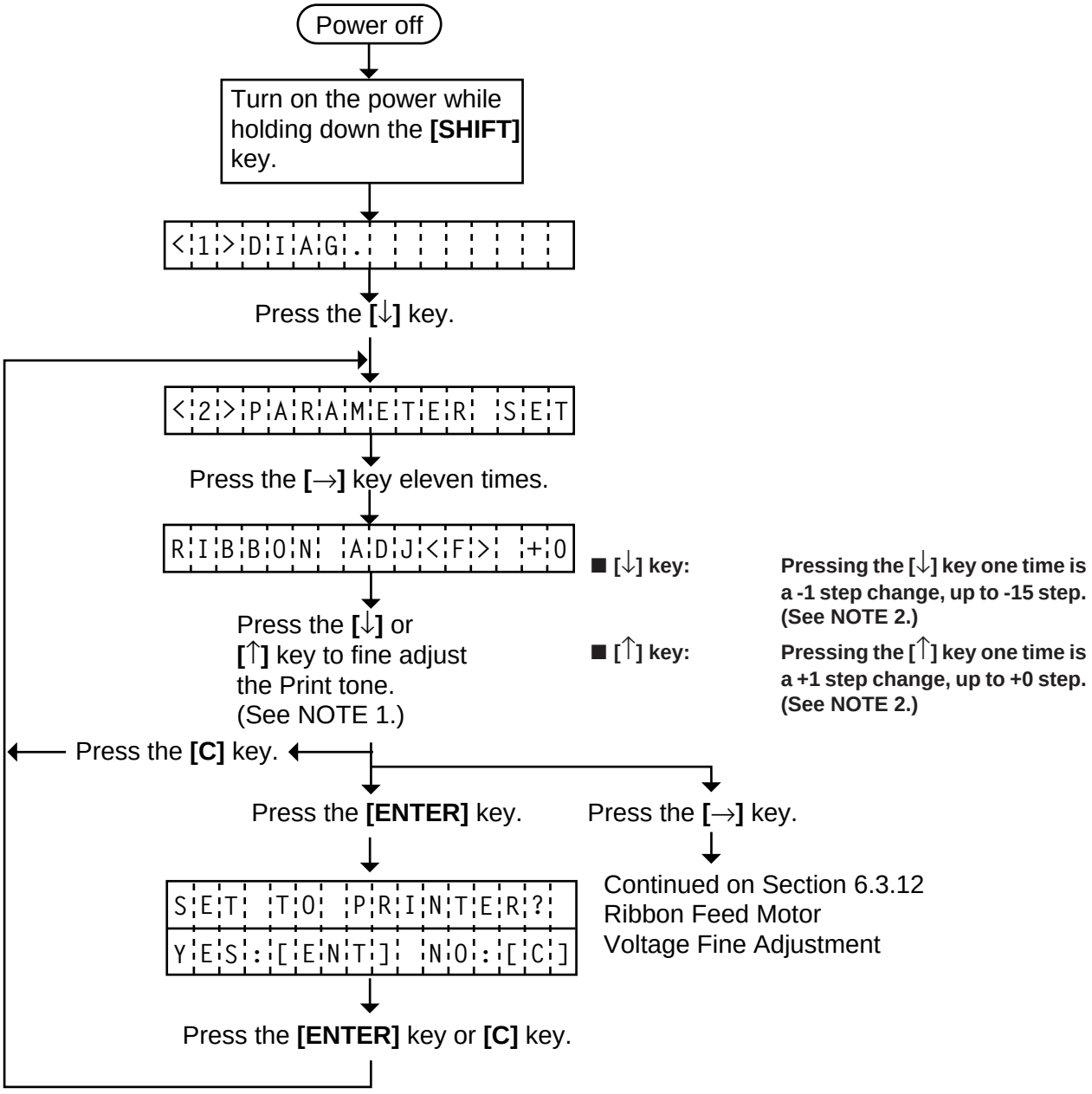
NOTES: *1. Holding the **[↓]** key or **[↑]** key down for more than 0.5 seconds enables a fast forward.*
*2. A changed transmission control mode is stored in keyboard memory by pressing the **[→]** key.*

6.3.10 Control Code Selection


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key ten times.
CODE AUTO
Select control code with the [↓] key or [↑] key. (See NOTE 1.)
• AUTO: (Automatic selection)
• ESC, LF, NUL: (Manual selection)
• { , ¦ , } : (Manual selection)
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Continued on Section 6.3.11 Ribbon Take-up motor Voltage Fine Adjustment
Press the [ENTER] key or [C] key.

NOTES: *1. Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*
2. A changed control code is stored in keyboard memory by pressing the [→] key.

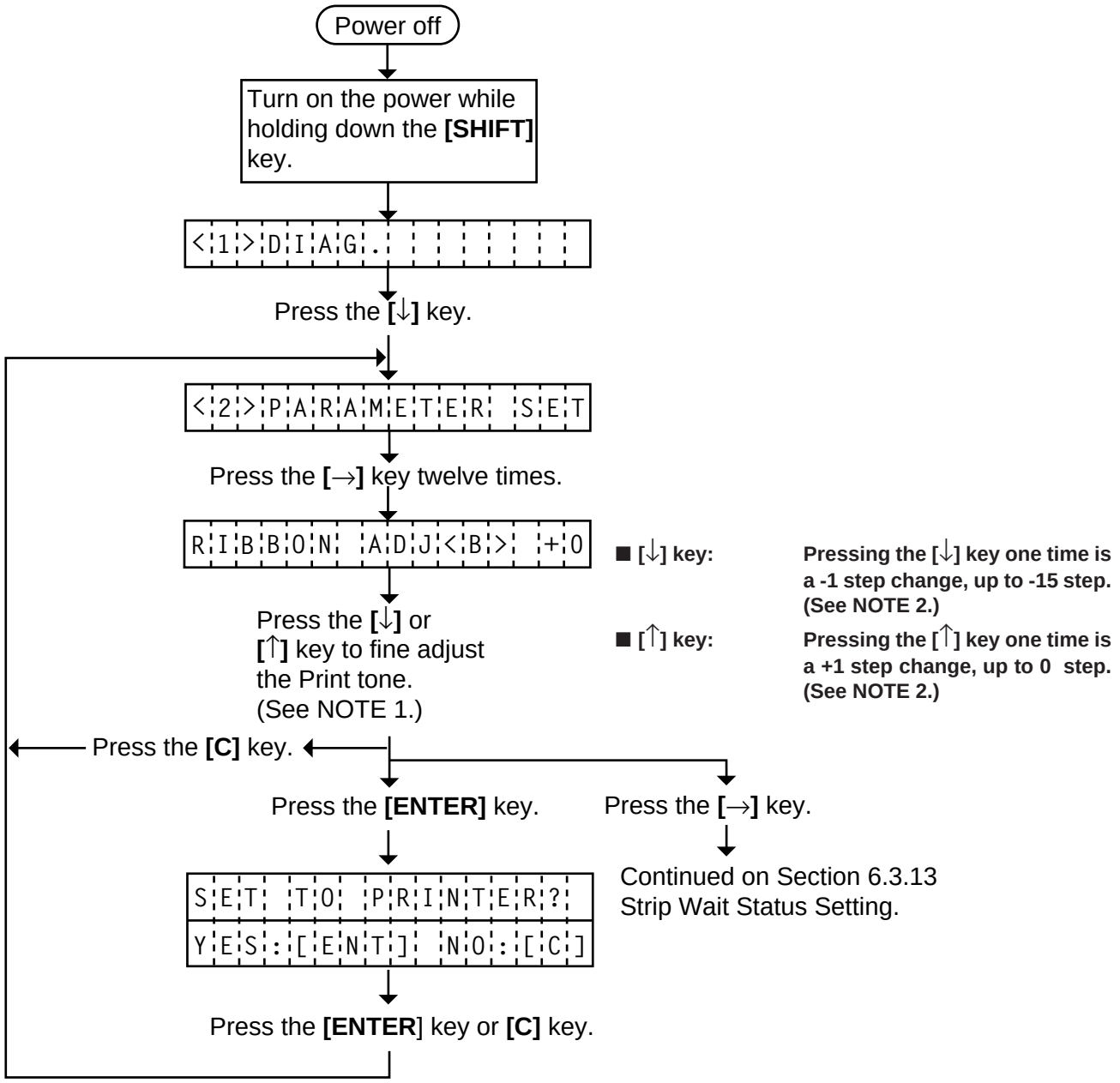
6.3.11 Ribbon Take-up Motor Voltage Fine Adjustment


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key eleven times.
RIBBON ADJ<F> +0
■ [↓] key:
Pressing the [↓] key one time is a -1 step change, up to -15 step. (See NOTE 2.)
■ [↑] key:
Pressing the [↑] key one time is a +1 step change, up to +0 step. (See NOTE 2.)
Press the [↓] or [↑] key to fine adjust the Print tone. (See NOTE 1.)
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Continued on Section 6.3.12 Ribbon Feed Motor Voltage Fine Adjustment
Press the [ENTER] key or [C] key.

NOTES: *1 Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*

2. A changed fine adjustment voltage is stored in keyboard memory by pressing the [→] key.

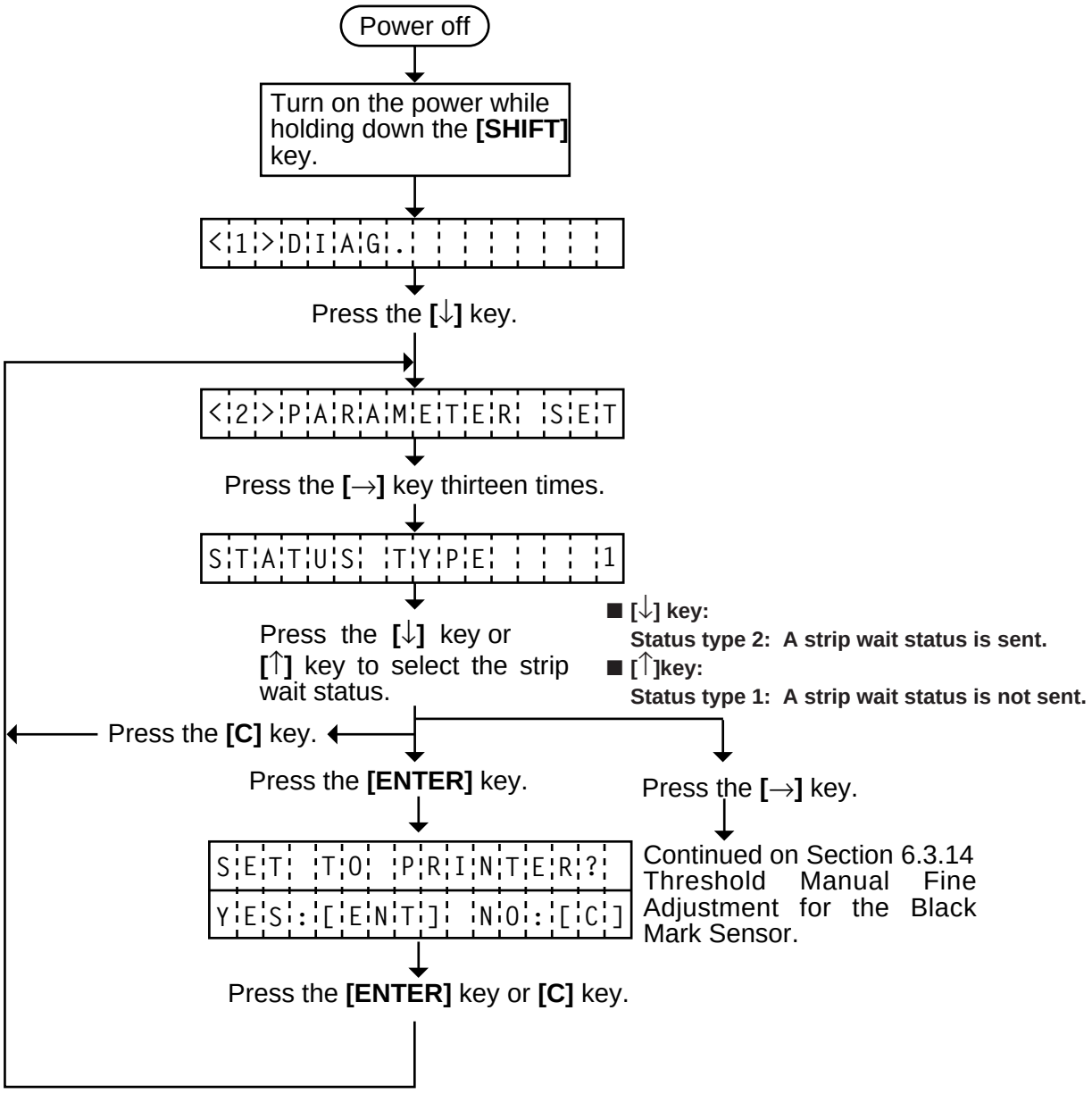
6.3.12 Ribbon Feed Motor Voltage Fine Adjustment


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key twelve times.
RIBBON ADJ<B> +0
Press the [↓] or [↑] key to fine adjust the Print tone. (See NOTE 1.)
■ [↓] key: Pressing the [↓] key one time is a -1 step change, up to -15 step. (See NOTE 2.)
■ [↑] key: Pressing the [↑] key one time is a +1 step change, up to 0 step. (See NOTE 2.)
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Press the [ENTER] key or [C] key.
Continued on Section 6.3.13 Strip Wait Status Setting.

NOTES: *1 Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*

2. A changed fine adjustment voltage is stored in keyboard memory by pressing the [→] key.

6.3.13 Strip Wait Status Setting


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key thirteen times.
STATUS TYPE 1
Press the [↓] key or [↑] key to select the strip wait status.
■ [↓] key:
Status type 2: A strip wait status is sent.
■ [↑]key:
Status type 1: A strip wait status is not sent.
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Continued on Section 6.3.14 Threshold Manual Fine Adjustment for the Black Mark Sensor.
Press the [ENTER] key or [C] key.

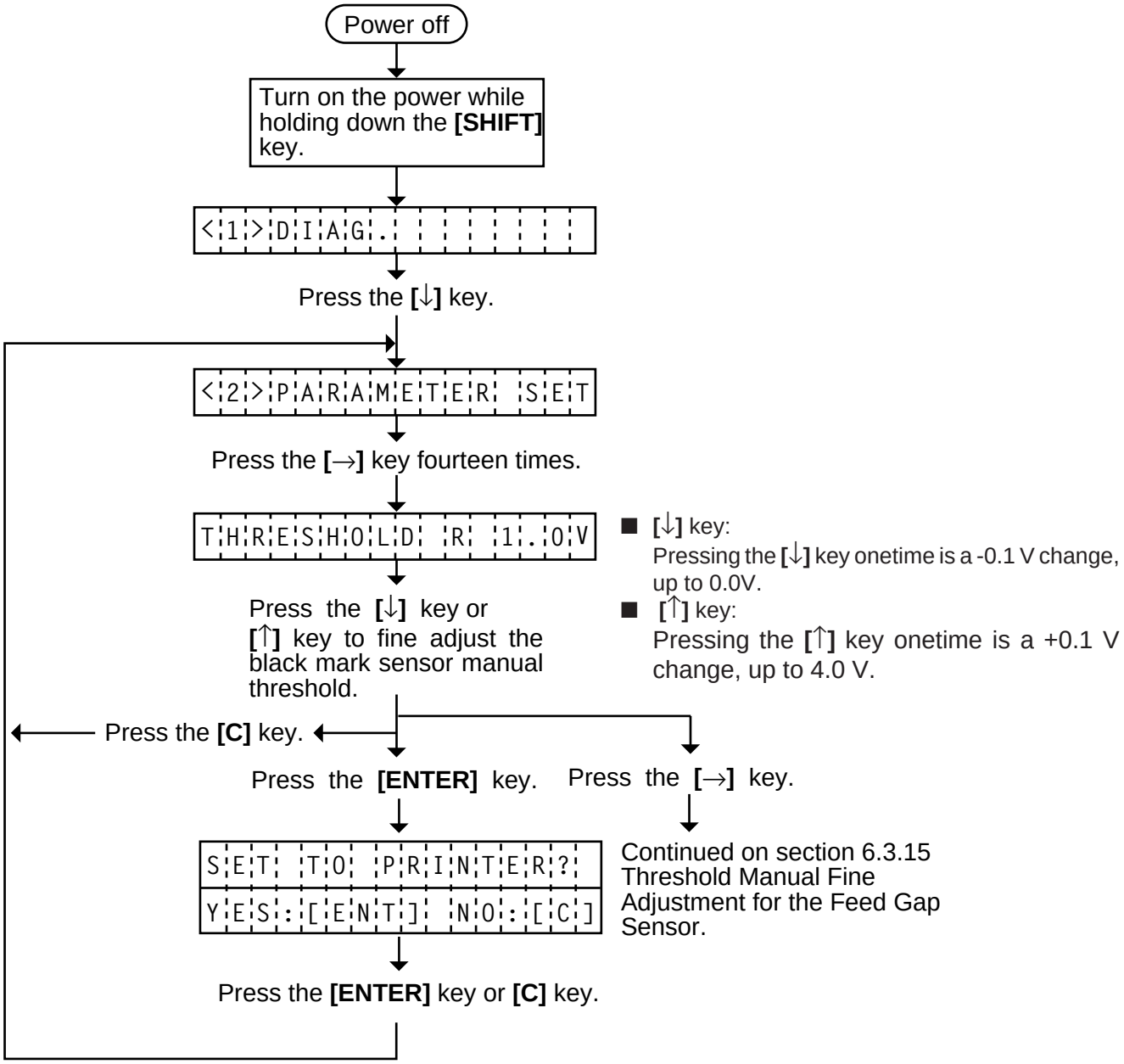
NOTES: *1. When the status type 1 is selected, the printer will send (00H) in response to the status request command sent from the PC while a label stays at the strip sensor (when idling, after feeding, or all printing finished).*

When the status type 2 is selected, the printer will send (05H) in response to the status request command sent from the PC while a label stays at the strip sensor (when idling, after feeding, or all printing finished.)

If the status request command is sent during printing, the printer will always send (05H) regardless of the setting.

*2. A changed strip wait status is stored in keyboard memory by pressing the **[→]** key.*

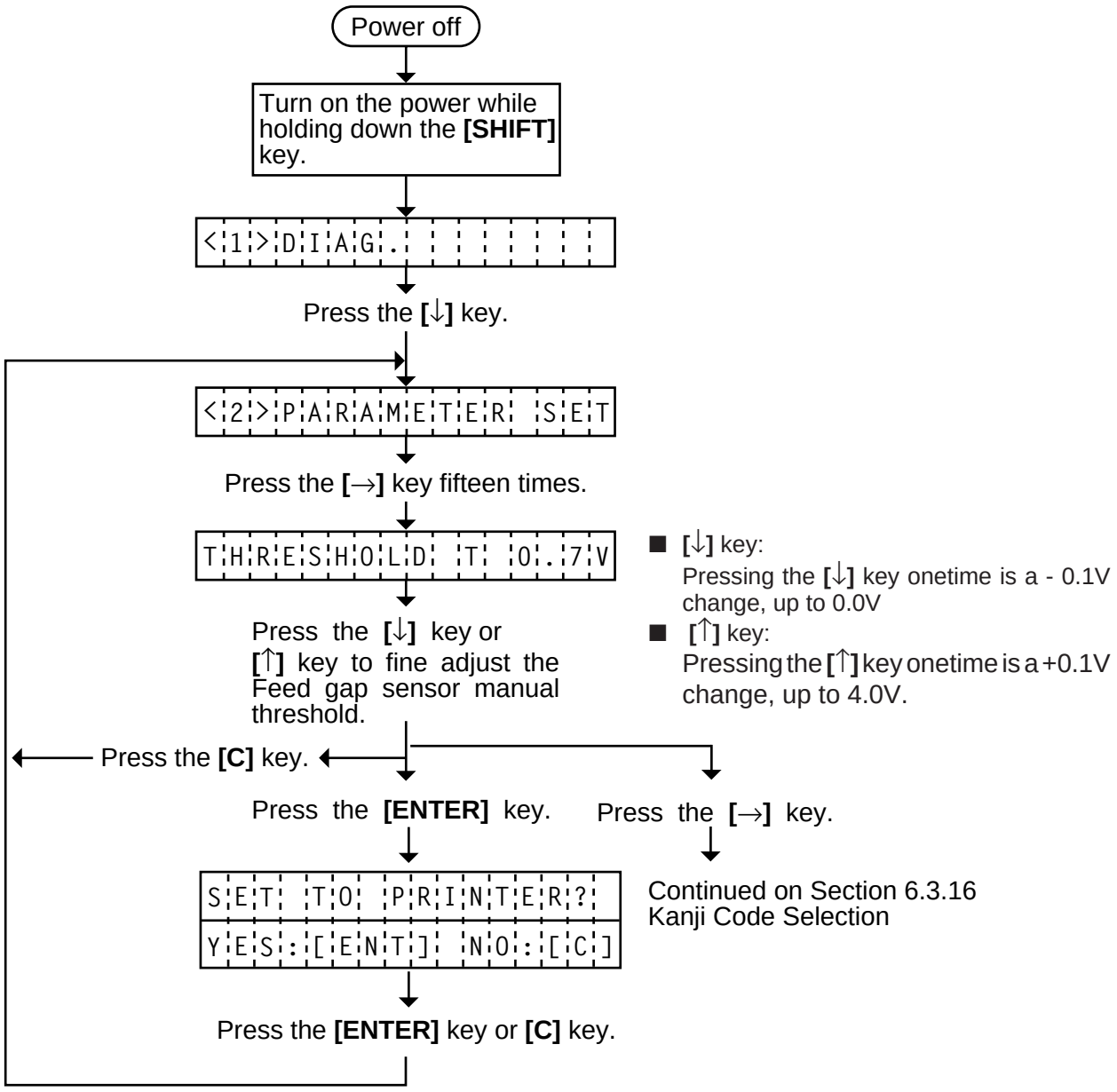
6.3.14 Threshold Manual Fine Adjustment for the Black Mark Sensor


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key fourteen times.
THRESHOLD R 1.0V
Press the [↓] key or [↑] key to fine adjust the black mark sensor manual threshold.
■ [↓] key:
Pressing the [↓] key onetime is a -0.1 V change, up to 0.0V.
■ [↑] key:
Pressing the [↑] key onetime is a +0.1 V change, up to 4.0 V.
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Press the [ENTER] key or [C] key.
Continued on section 6.3.15 Threshold Manual Fine Adjustment for the Feed Gap Sensor.

NOTE: *1. Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*

2. A changed threshold fine adjustment voltage is stored in keyboard memory by pressing the [→] key.

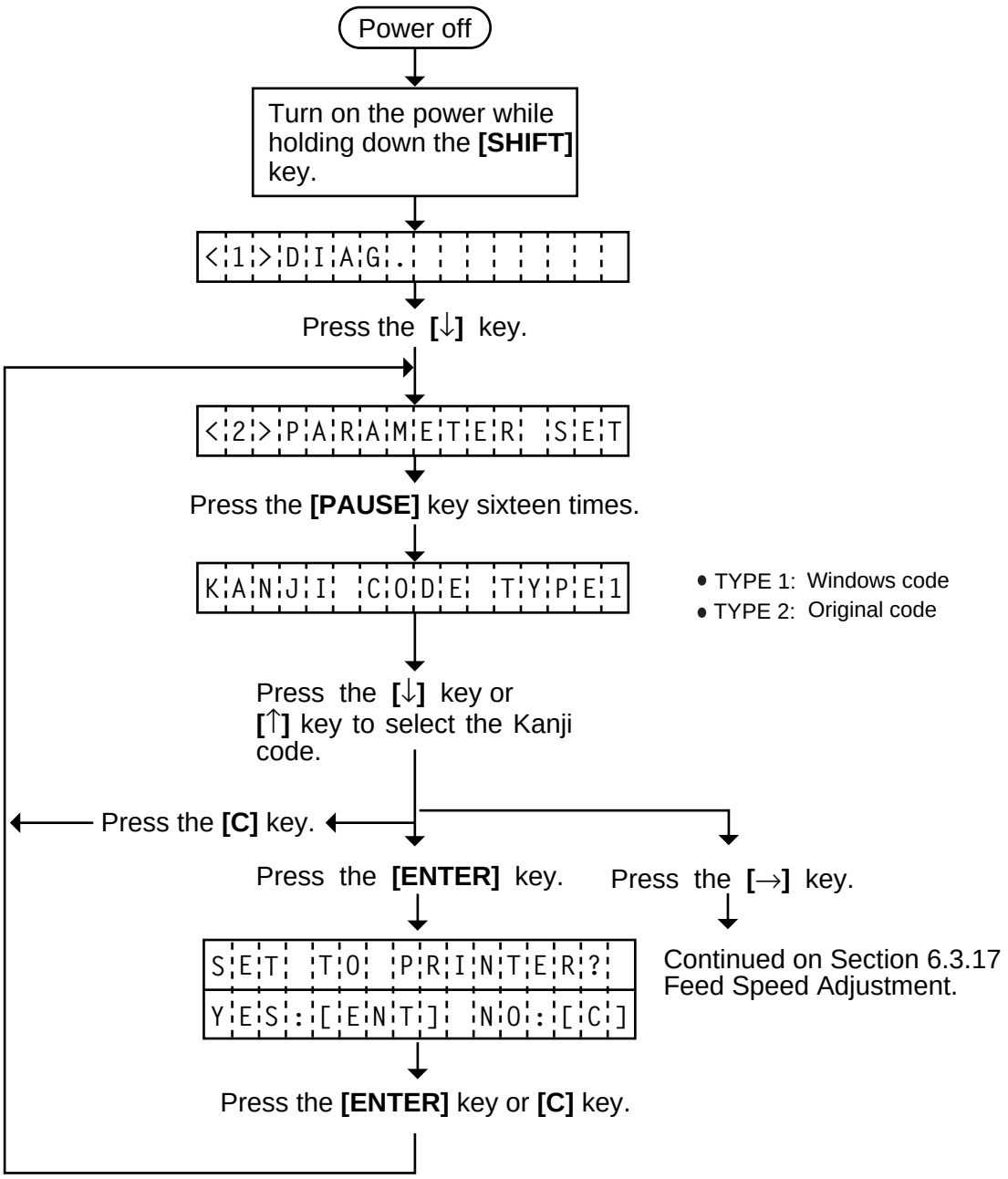
6.3.15 Threshold Manual Fine Adjustment for the Feed Gap Sensor


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key fifteen times.
THRESHOLD T 0.7V
Press the [↓] key or [↑] key to fine adjust the Feed gap sensor manual threshold.
■ [↓] key:
Pressing the [↓] key onetime is a - 0.1V change, up to 0.0V
■ [↑] key:
Pressing the [↑] key onetime is a +0.1V change, up to 4.0V.
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Continued on Section 6.3.16 Kanji Code Selection
Press the [ENTER] key or [C] key.

NOTE: *1. Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*

2. A changed threshold fine adjustment voltage is stored in keyboard memory by pressing the [→] key.

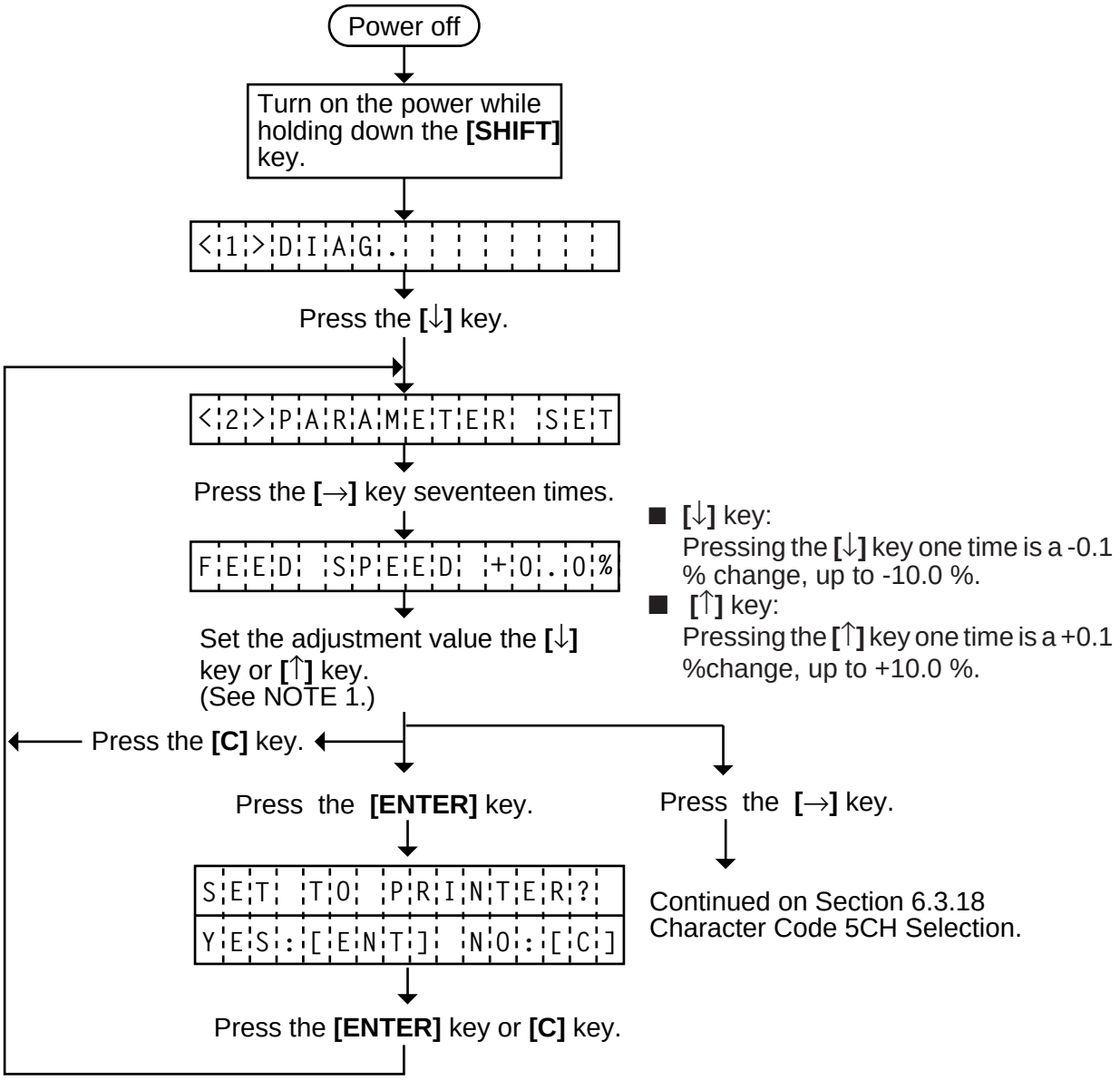
6.3.16 Kanji Code Selection


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [PAUSE] key sixteen times.
KANJI CODE TYPE1
• TYPE 1: Windows code
• TYPE 2: Original code
Press the [↓] key or [↑] key to select the Kanji code.
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Continued on Section 6.3.17 Feed Speed Adjustment.
Press the [ENTER] key or [C] key.

NOTE: *1. Holding the **[↓]** key or **[↑]** key down for more than 0.5 seconds enables a fast forward.*
*2. A changed Kanji code is stored in keyboard memory by pressing the **[→]** key.*

6.3.17 Feed Speed Adjustment

After using the printer for a long period of time, the platen will abrade, causing a shrunk printing. In such case, use the following procedure to store a fine adjustment value of timing pulse cycle which drives the stepping motor in EEPROM. This value will optimize the platen rotation to correct the print position.


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key seventeen times.
FEED SPEED +0.0%
Set the adjustment value the [↓] key or [↑] key. (See NOTE 1.)
■ [↓] key: Pressing the [↓] key one time is a -0.1 % change, up to -10.0 %.
■ [↑] key: Pressing the [↑] key one time is a +0.1 %change, up to +10.0 %.
Press the [C] key.
Press the [ENTER] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Press the [ENTER] key or [C] key.
Continued on Section 6.3.18 Character Code 5CH Selection.

NOTE: *1. Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*
2. A changed feed speed is stored in keyboard memory by pressing the [→] key.

[Example of Adjustment]

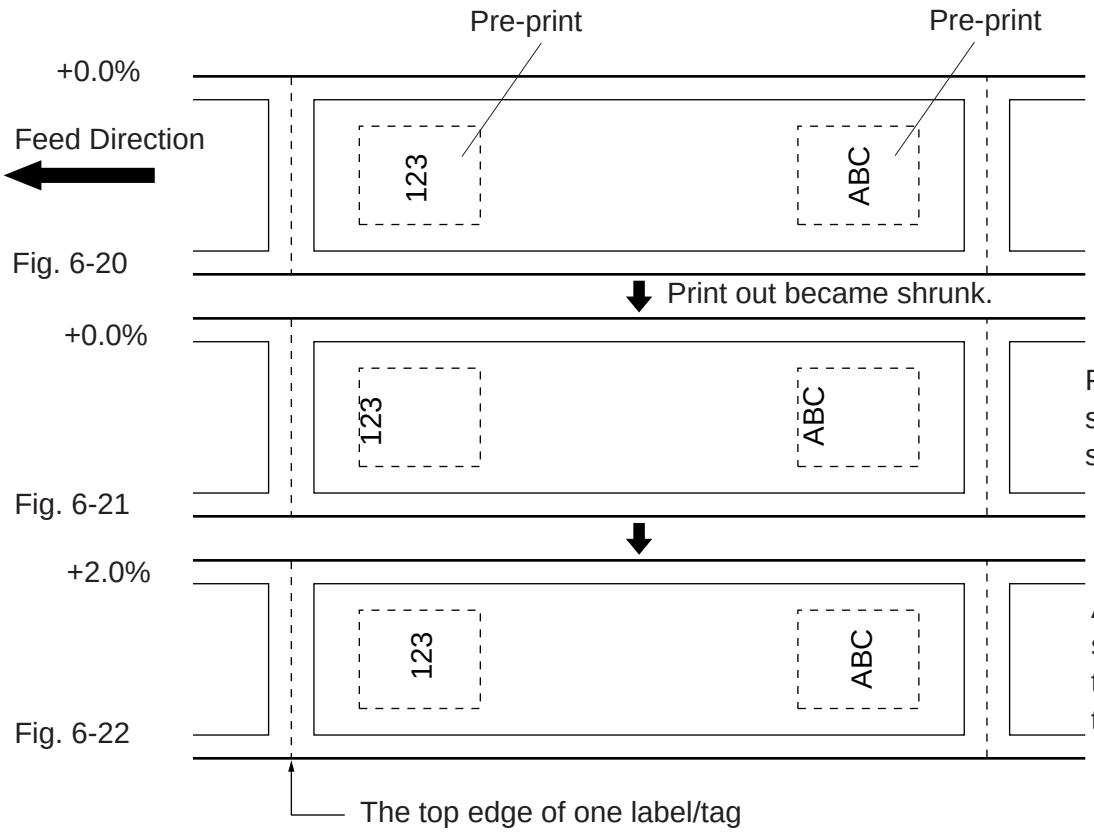


Fig. 6-20

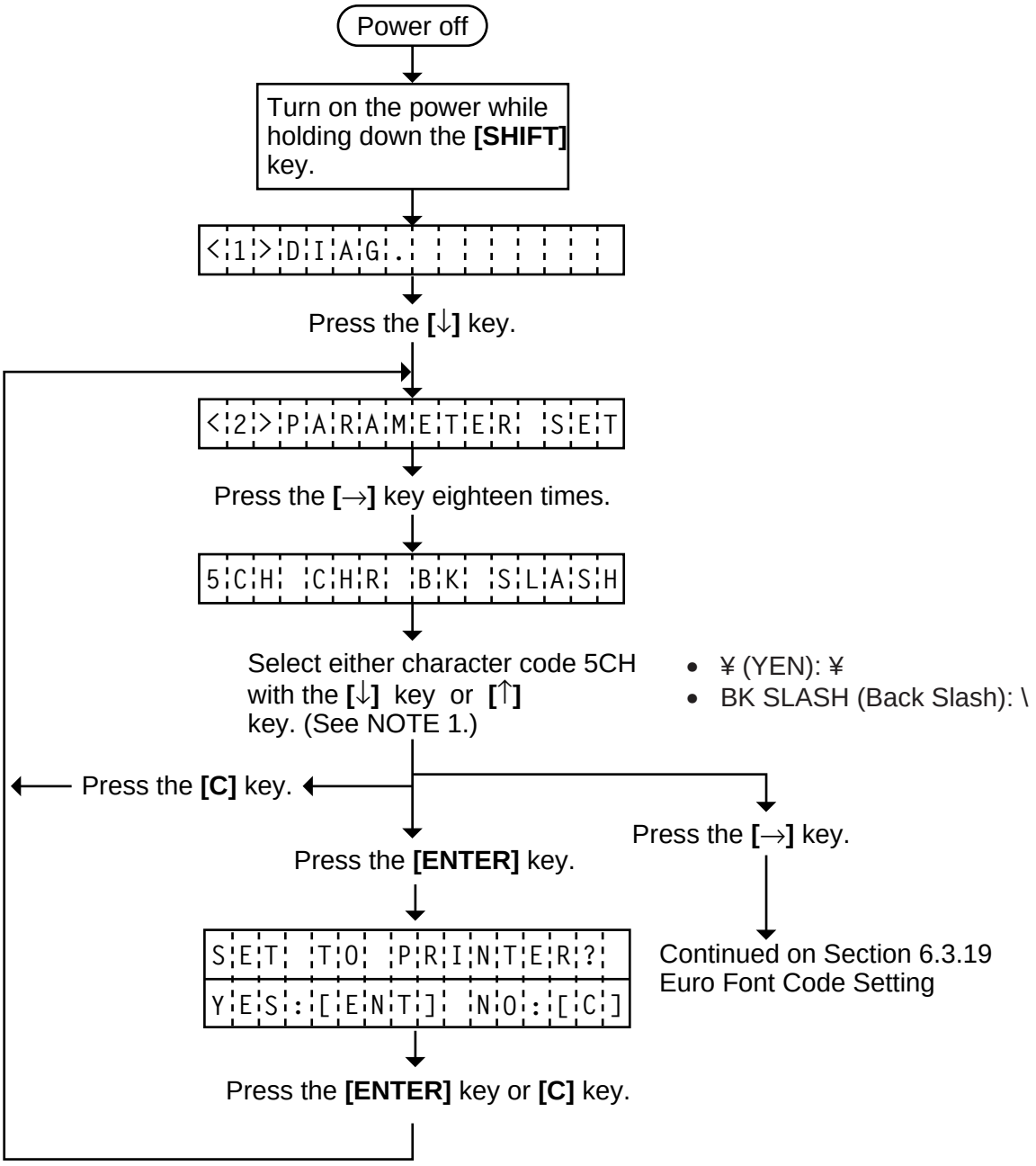
Fig. 6-21

Fig. 6-22

Print is out of position due to a shrunk printing.

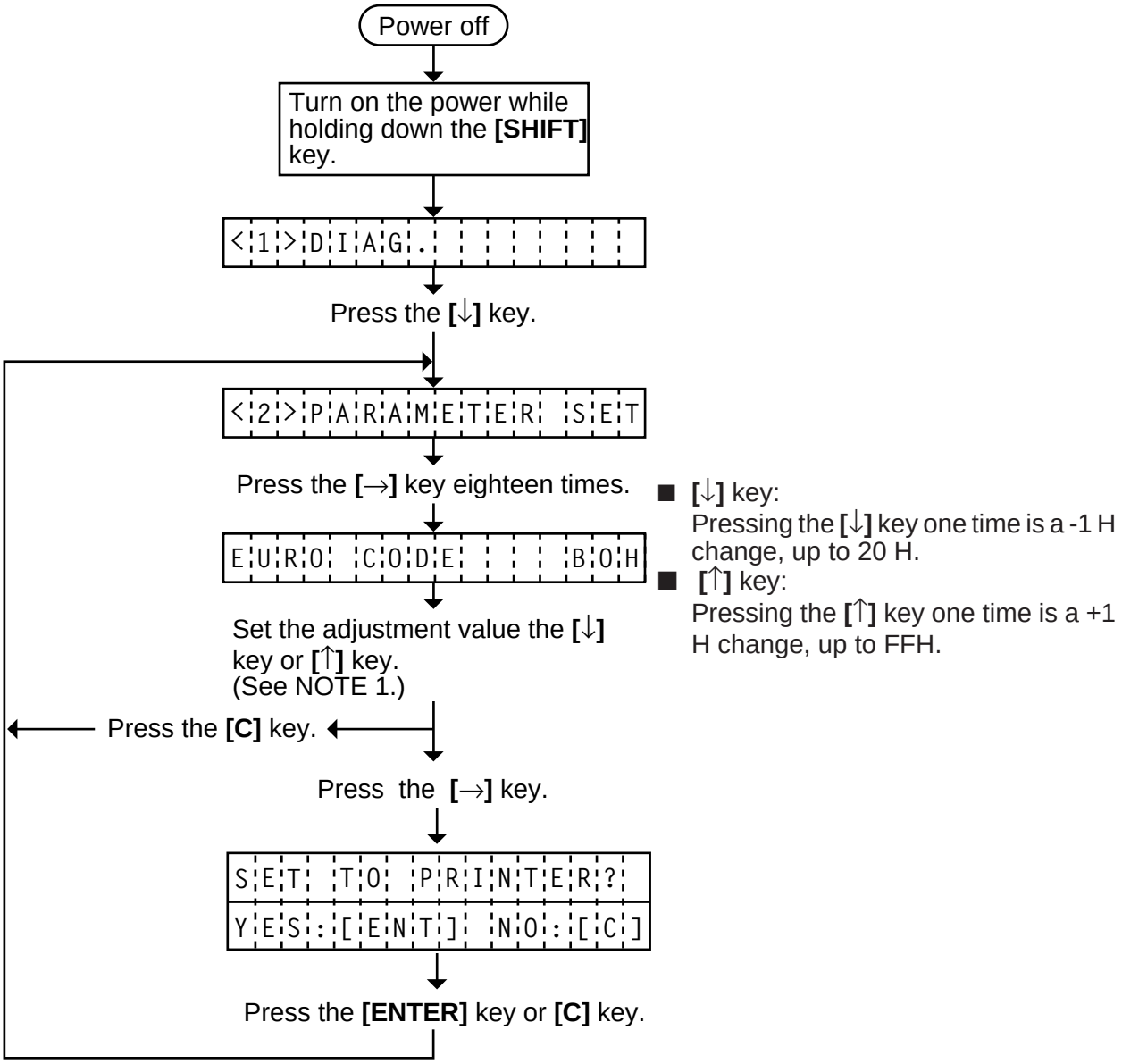
Adjust the feed speed to print in the correct position.

6.3.18 Character Code 5CH Selection


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key eighteen times.
5CH CHR BK SLASH
Select either character code 5CH with the [↓] key or [↑] key. (See NOTE 1.)
• ¥ (YEN): ¥
• BK SLASH (Back Slash): \
Press the [C] key.
Press the [→] key.
Press the [ENTER] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Continued on Section 6.3.19 Euro Font Code Setting
Press the [ENTER] key or [C] key.

NOTES: *1. Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*
2. A changed zero font is stored in keyboard memory by pressing the [→] key.

6.3.19 Euro Font Code Setting


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key.
<2>PARAMETER SET
Press the [→] key eighteen times.
EURO CODE BOH
Set the adjustment value the [↓] key or [↑] key. (See NOTE 1.)
Press the [C] key.
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Press the [ENTER] key or [C] key.
■ [↓] key: Pressing the [↓] key one time is a -1 H change, up to 20 H.
■ [↑] key: Pressing the [↑] key one time is a +1 H change, up to FFH.

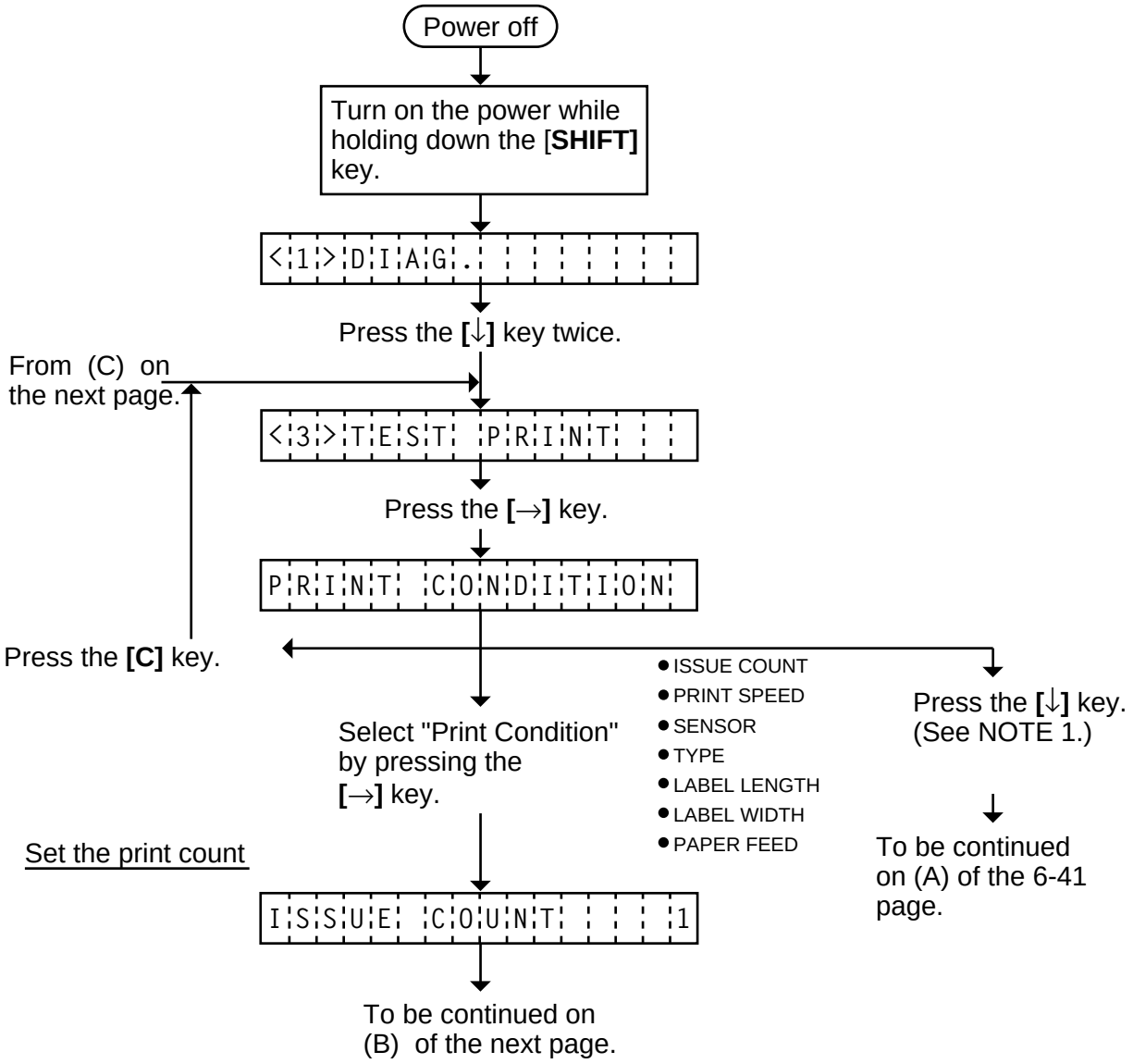
NOTE: *1. Holding the [↓] key or [↑] key down for more than 0.5 seconds enables a fast forward.*
2. A changed Euro font code is stored in keyboard memory by pressing the [→] key.

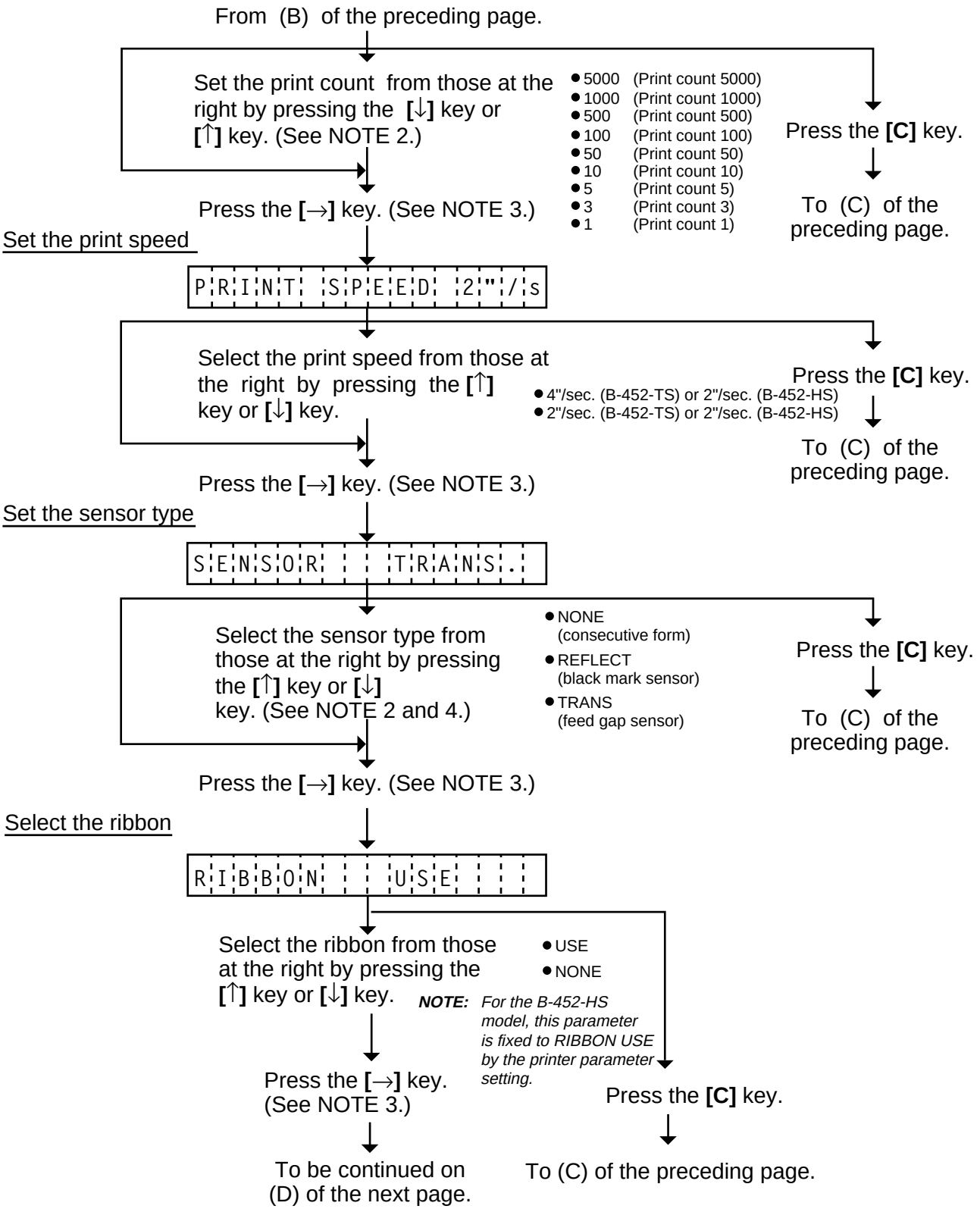
6.4 TEST PRINT MODE (When using the KB-80-QM Optional Keyboard)

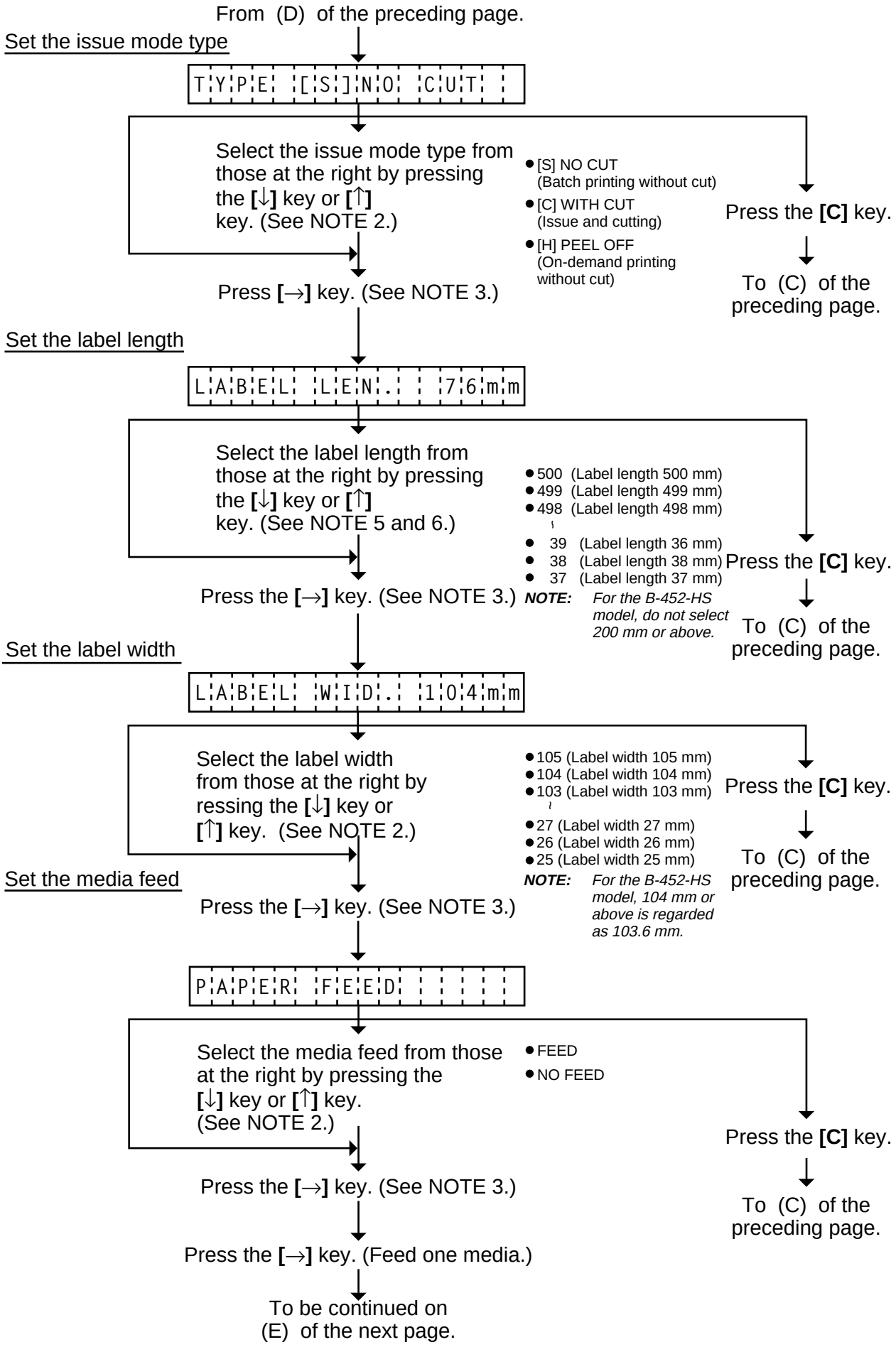
Eight kinds of test prints are provided in the test print mode. When performing the test print, 7 parameters should be set. The default parameter at power on is as below:

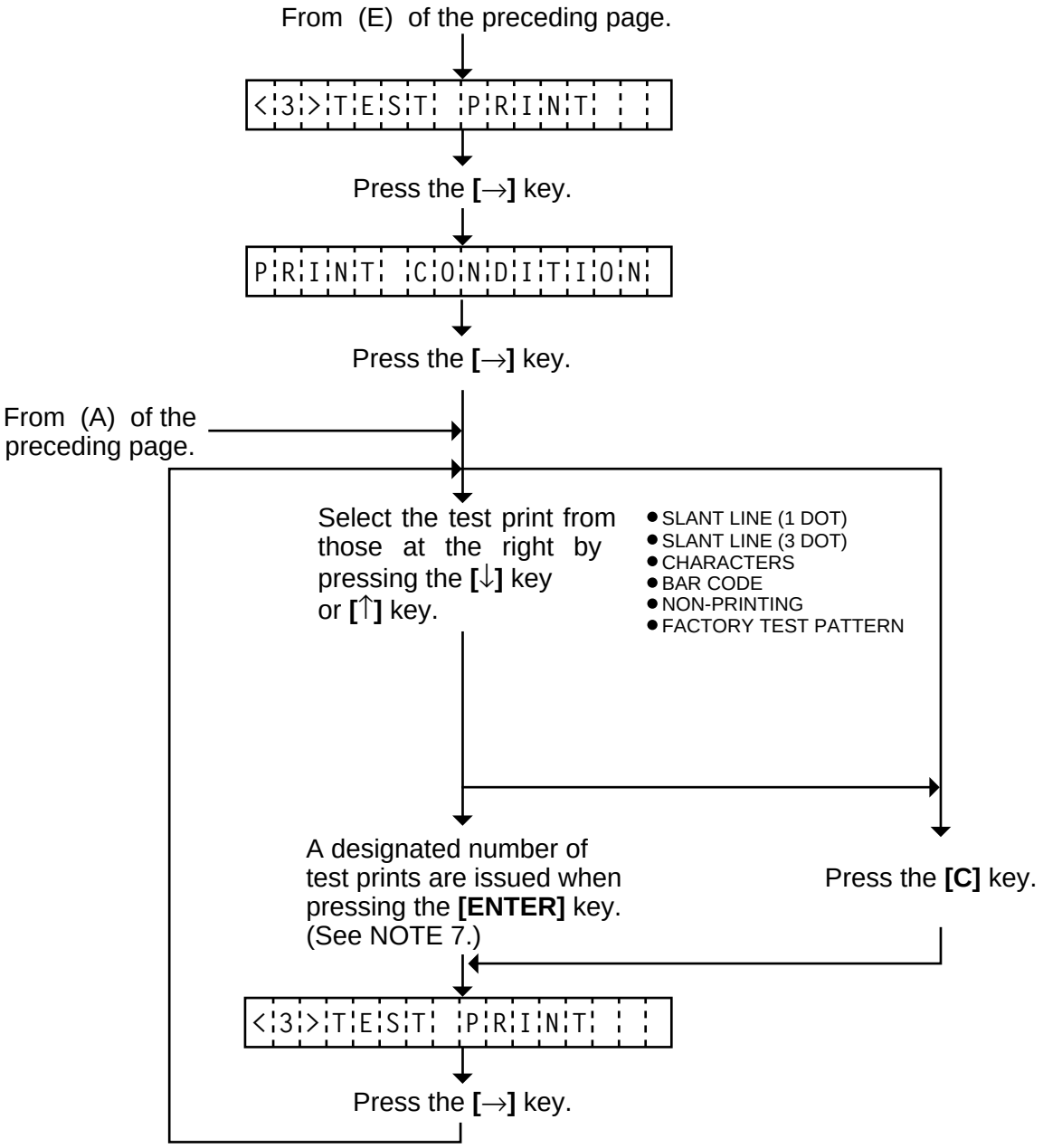
- ISSUE COUNT : 1
- PRINT SPEED : 2 inch/sec.
- SENSOR : Transmissive sensor (Feed gap sensor)
- TYPE : Batch (without cut)
- LABEL LENGTH : 76 mm
- LABEL WIDTH : 104 mm
- PAPER FEED : Feed

Operating procedure for the test mode is provided below.


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key twice.
From (C) on the next page.
<3>TEST PRINT
Press the [→] key.
PRINT CONDITION
Press the [C] key.
ISSUE COUNT
PRINT SPEED
SENSOR
TYPE
LABEL LENGTH
LABEL WIDTH
PAPER FEED
Press the [↓] key. (See NOTE 1.)
Select "Print Condition" by pressing the [→] key.
Set the print count
ISSUE COUNT 1
To be continued on (A) of the 6-41 page.
To be continued on (B) of the next page.


From (B) of the preceding page.
Set the print count from those at the right by pressing the [↓] key or [↑] key. (See NOTE 2.)
● 5000 (Print count 5000)
● 1000 (Print count 1000)
● 500 (Print count 500)
● 100 (Print count 100)
● 50 (Print count 50)
● 10 (Print count 10)
● 5 (Print count 5)
● 3 (Print count 3)
● 1 (Print count 1)
Press the [C] key.
To (C) of the preceding page.
Press the [→] key. (See NOTE 3.)
Set the print speed
PRINT SPEED 2"/s
Select the print speed from those at the right by pressing the [↑] key or [↓] key.
● 4"/sec. (B-452-TS) or 2"/sec. (B-452-HS)
● 2"/sec. (B-452-TS) or 2"/sec. (B-452-HS)
Press the [C] key.
To (C) of the preceding page.
Press the [→] key. (See NOTE 3.)
Set the sensor type
SENSOR TRANS.
Select the sensor type from those at the right by pressing the [↑] key or [↓] key. (See NOTE 2 and 4.)
● NONE (consecutive form)
● REFLECT (black mark sensor)
● TRANS (feed gap sensor)
Press the [C] key.
To (C) of the preceding page.
Press the [→] key. (See NOTE 3.)
Select the ribbon
RIBBON USE
Select the ribbon from those at the right by pressing the [↑] key or [↓] key.
● USE
● NONE
NOTE: For the B-452-HS model, this parameter is fixed to RIBBON USE by the printer parameter setting.
Press the [→] key. (See NOTE 3.)
To be continued on (D) of the next page.
Press the [C] key.
To (C) of the preceding page.


From (D) of the preceding page.
Set the issue mode type
TYPE [S]NO CUT
Select the issue mode type from those at the right by pressing the [↓] key or [↑] key. (See NOTE 2.)
● [S] NO CUT (Batch printing without cut)
● [C] WITH CUT (Issue and cutting)
● [H] PEEL OFF (On-demand printing without cut)
Press the [C] key.
To (C) of the preceding page.
Press [→] key. (See NOTE 3.)
Set the label length
LABEL LEN. 76mm
Select the label length from those at the right by pressing the [↓] key or [↑] key. (See NOTE 5 and 6.)
● 500 (Label length 500 mm)
● 499 (Label length 499 mm)
● 498 (Label length 498 mm)
● 39 (Label length 36 mm)
● 38 (Label length 38 mm)
● 37 (Label length 37 mm)
NOTE: For the B-452-HS model, do not select 200 mm or above.
Press the [C] key.
To (C) of the preceding page.
Press the [→] key. (See NOTE 3.)
Set the label width
LABEL WID. 104mm
Select the label width from those at the right by ressing the [↓] key or [↑] key. (See NOTE 2.)
● 105 (Label width 105 mm)
● 104 (Label width 104 mm)
● 103 (Label width 103 mm)
● 27 (Label width 27 mm)
● 26 (Label width 26 mm)
● 25 (Label width 25 mm)
NOTE: For the B-452-HS model, 104 mm or above is regarded as 103.6 mm.
Press the [C] key.
To (C) of the preceding page.
Set the media feed
Press the [→] key. (See NOTE 3.)
PAPER FEED
Select the media feed from those at the right by pressing the [↓] key or [↑] key. (See NOTE 2.)
● FEED
● NO FEED
Press the [C] key.
To (C) of the preceding page.
Press the [→] key. (See NOTE 3.)
Press the [→] key. (Feed one media.)
To be continued on (E) of the next page.


From (E) of the preceding page.
<3>TEST PRINT
Press the [→] key.
PRINT CONDITION
Press the [→] key.
From (A) of the preceding page.
Select the test print from those at the right by pressing the [↓] key or [↑] key.
● SLANT LINE (1 DOT)
● SLANT LINE (3 DOT)
● CHARACTERS
● BAR CODE
● NON-PRINTING
● FACTORY TEST PATTERN
A designated number of test prints are issued when pressing the [ENTER] key. (See NOTE 7.)
Press the [C] key.
<3>TEST PRINT
Press the [→] key.

NOTES:

1. *When there is no change to the print condition, select one of the test print options to issue the test print.*
2. *Holding the **[↓]** key or **[↑]** key down for more than 0.5 seconds enables a fast forward.*
3. *A selected print condition is activated when the **[→]** key is pressed.*
4. *When the feed gap sensor is selected, the gap between labels becomes 3mm long.*
5. *A label size greater than the image buffer length cannot be designated. The image buffer length differs according to memory size. If designated, the printer prints in the image buffer, or the printer stops because of an error.*
6. *Pressing the **[↓]** key changes the label length -1 mm, pressing the **[↑]** key changes +1 mm.*
7. *When an error occurs during a test print, the error message is displayed and printing is stopped. The error is cleared by pressing the **[C]** key and the display shows "<3> TEST PRINT". Printing is not automatically resumed after the error is cleared.*

8. When "AUTO PRINT" is selected, 5 pcs. of the 3-dot slant line labels, bar code labels and character labels are printed respectively after one label is fed.

■ Test Print Sample

• Slant line (1 dot)

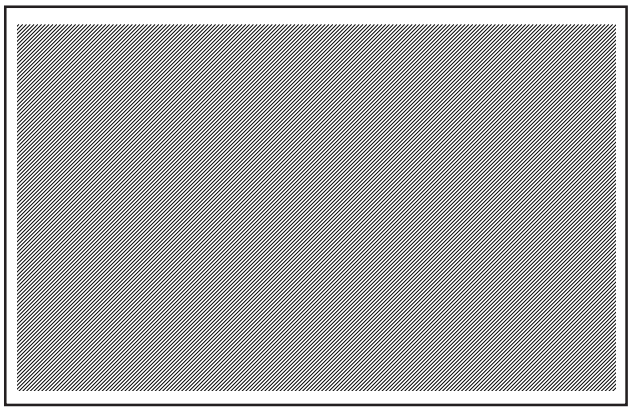


Fig. 6-23

• Slant line (3 dot)

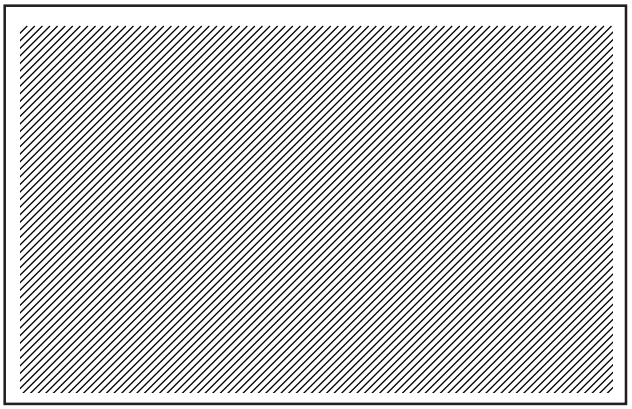


Fig. 6-24

• Characters

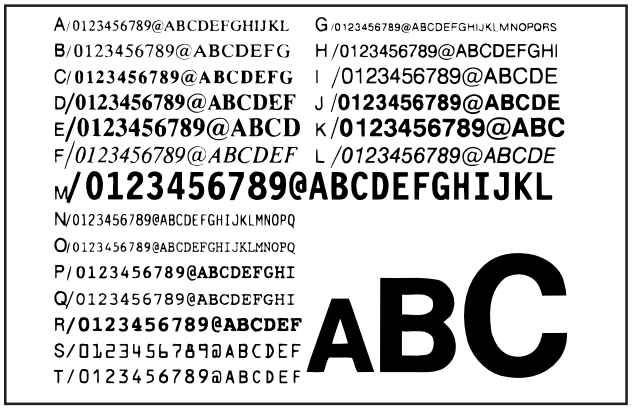


Fig. 6-25

• Bar code

Fig. 6-26

• Factory Test Pattern

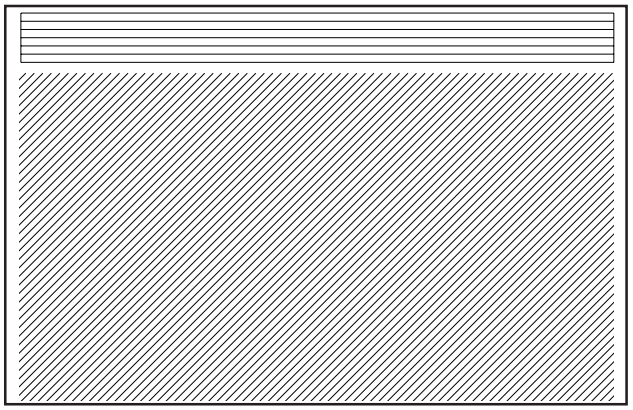


Fig. 6-27

■ Auto paper feed

At a test print with the cut mode being specified, the auto paper feed (advancing the paper four about 10 mm to prevent the leading edge of the paper from winding onto the platen) is performed after printing or feeding. The following table shows whether or not the auto paper feed and auto reverse feed is performed after changing the test print mode to the following mode:

Issue mode	Auto paper feed	Auto reverse feed
Batch	None	Performed if the paper has been advanced.
Cut	Performed	Performed if the paper has been advanced.
Strip	None	None (even if the paper has been advanced.)
Self diagnosis print	None	None (even if the paper has been advanced.)

NOTES: *1. Even if the auto paper feed has been performed in online mode, an auto reverse feed is not performed when starting a test print.*

2. Even if the auto paper feed has been performed in test print mode, an auto reverse feed is not performed in online mode.

3. After a self diagnosis print, an auto reverse feed is not performed for printing the first paper in online mode.

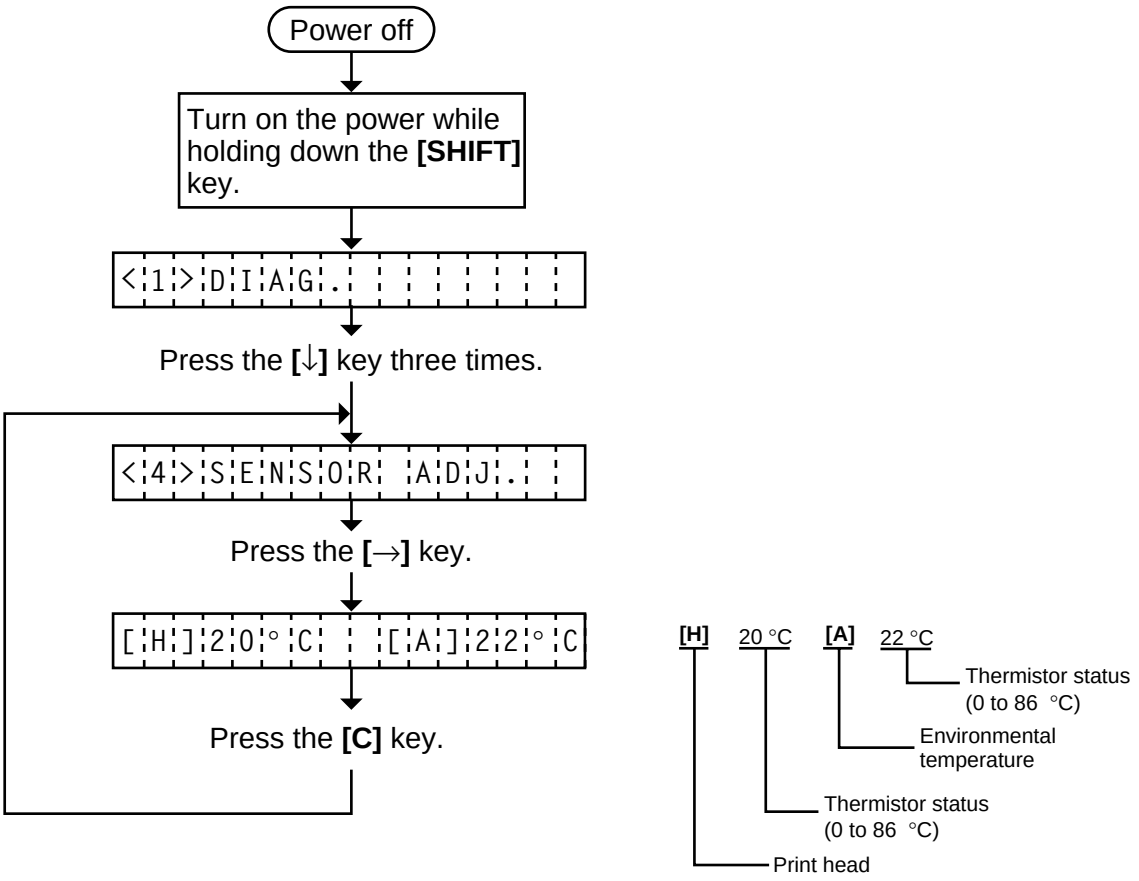
4. After the print head is raised and lowered, the auto paper feed is canceled.

6.5 SENSOR SETTING MODE (When using the KB-80-QM Optional Keyboard)

Thermistor check and black mark/feed gap sensor settings are provided in the sensor setting mode. The value set in this mode is printed as data of sensor 2 in Automatic diagnosis printing in self test mode.

6.5.1 Thermistor Check

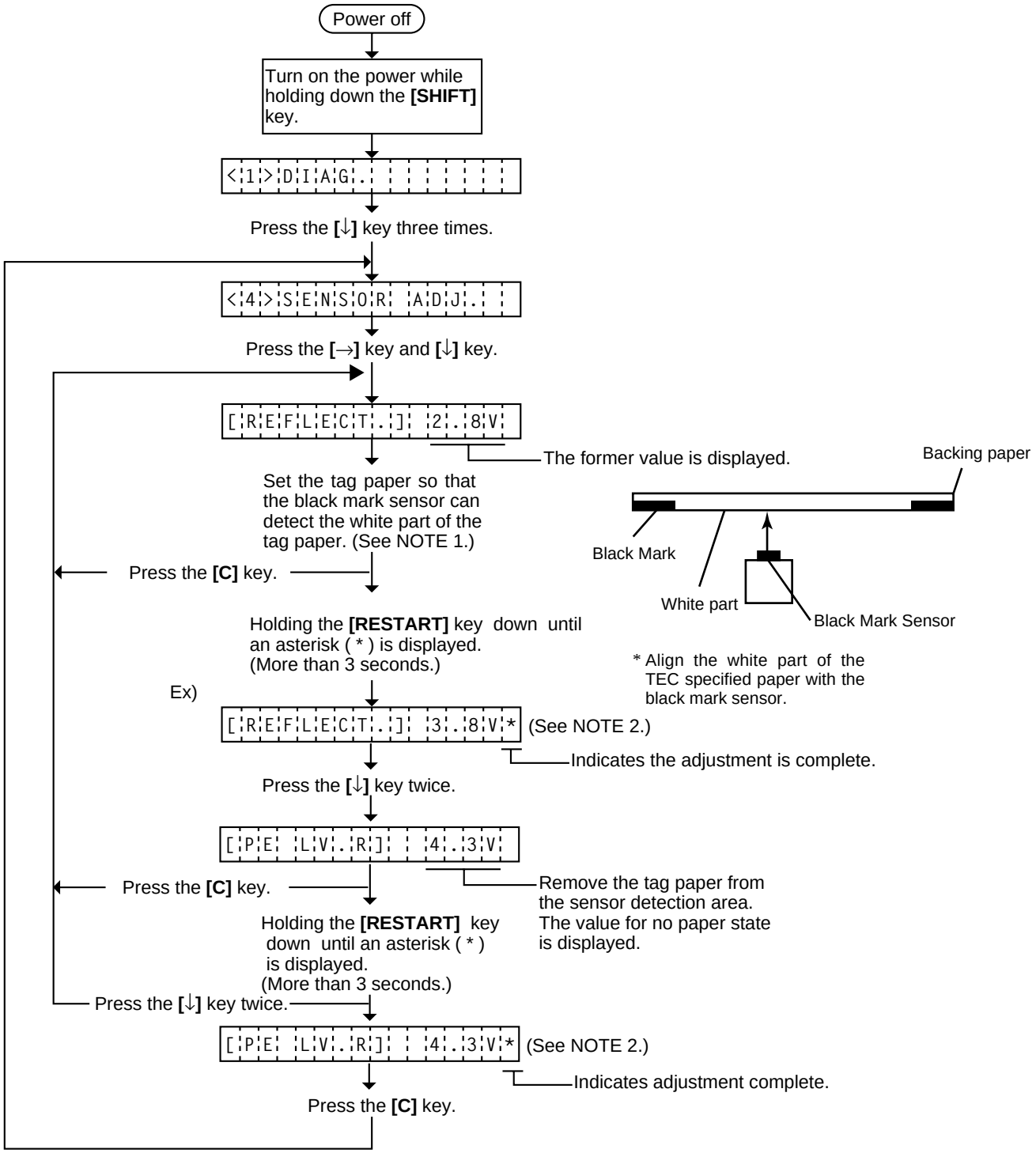
Thermistor check should be performed to check the environmental temperature and print head temperature after the excess head temp. error occurs or batch printing is performed for a long time.



NOTE: *Since the thermistor is supervised every 200 ms while displaying the status, the display could vary.*

6.5.2 Black Mark Sensor Adjustment

Black mark sensor setting should be performed after replacing the CPU PC board or changing the tag paper to other maker's one, or when a paper feed error occurs.

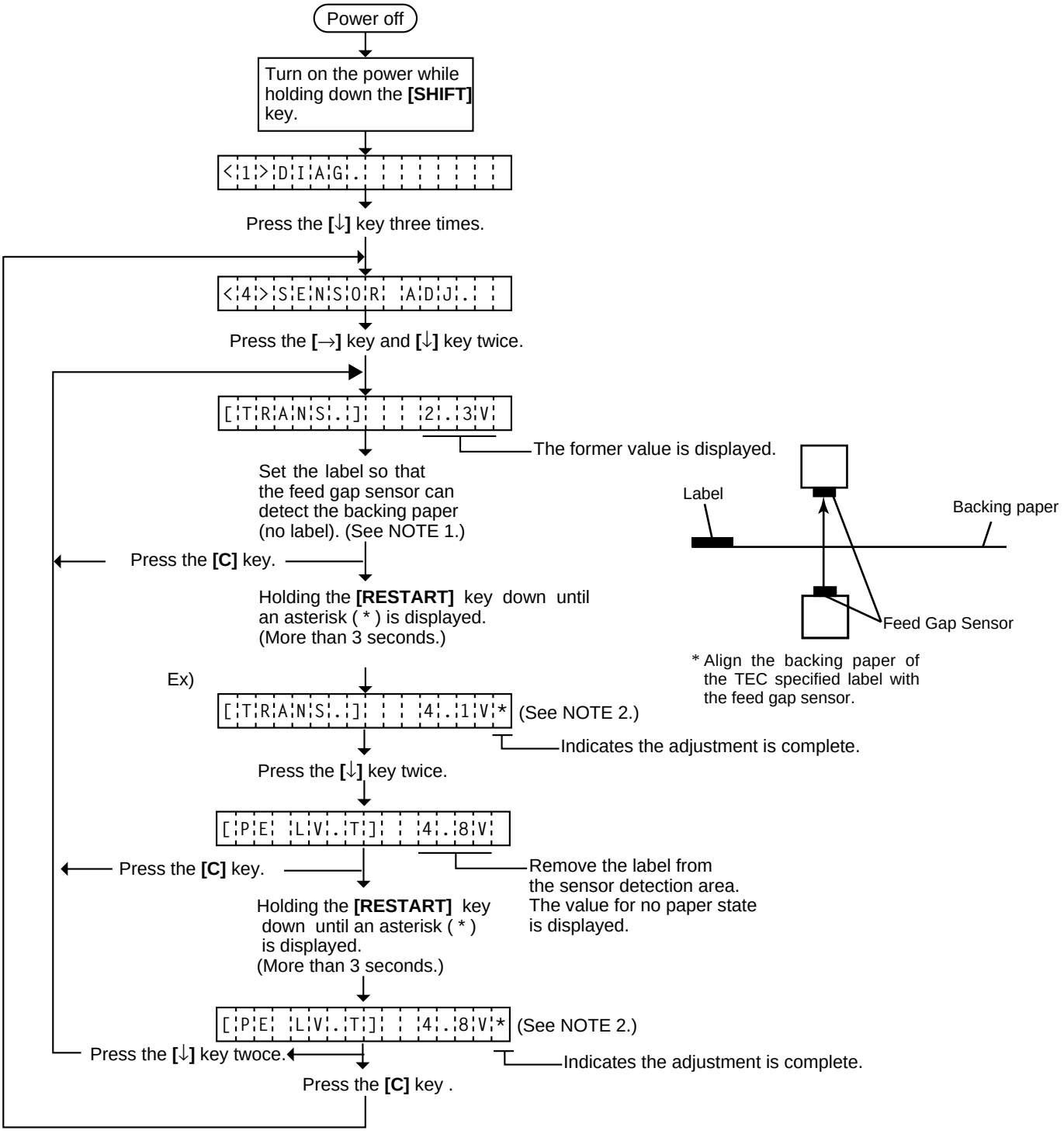

Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG..
Press the [↓] key three times.
<4>SENSOR ADJ..
Press the [→] key and [↓] key.
[REFLECT..] 2.8V
The former value is displayed.
Backing paper
Set the tag paper so that the black mark sensor can detect the white part of the tag paper. (See NOTE 1.)
Black Mark
White part
Black Mark Sensor
Press the [C] key.
Holding the [RESTART] key down until an asterisk (*) is displayed. (More than 3 seconds.)
* Align the white part of the TEC specified paper with the black mark sensor.
Ex)
[REFLECT..] 3.8V* (See NOTE 2.)
Indicates the adjustment is complete.
Press the [↓] key twice.
[PE LVL.R] 4.3V
Press the [C] key.
Remove the tag paper from the sensor detection area. The value for no paper state is displayed.
Holding the [RESTART] key down until an asterisk (*) is displayed. (More than 3 seconds.)
Press the [↓] key twice.
[PE LVL.R] 4.3V* (See NOTE 2.)
Indicates adjustment complete.
Press the [C] key.

NOTES: *1. Be sure to adjust the black mark sensor using the white part of the tag paper as a criterion. Though an adjustment can be performed with the black mark, it may cause a paper jam error.*

*2. Pressing the **[↓]** key validates the sensor adjustment. The value of the sensor is displayed up to 5.0 V.*

6.5.3 Feed Gap Sensor Adjustment

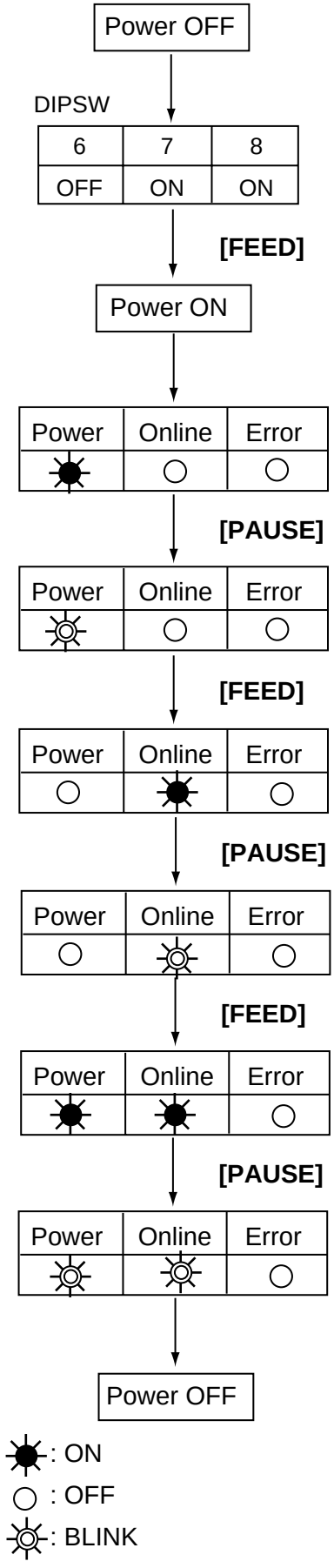
Feed gap sensor setting should be performed after replacing the CPU PC board or changing the label to other maker's one, or when a paper feed error occurs.


Power off
Turn on the power while holding down the [SHIFT] key.
<1>DIAG.
Press the [↓] key three times.
<4>SENSOR ADJ.
Press the [→] key and [↓] key twice.
[TRANS.] 2.3V
The former value is displayed.
Set the label so that the feed gap sensor can detect the backing paper (no label). (See NOTE 1.)
Press the [C] key.
Holding the [RESTART] key down until an asterisk (*) is displayed. (More than 3 seconds.)
Ex)
[TRANS.] 4.1V*
(See NOTE 2.)
Indicates the adjustment is complete.
Press the [↓] key twice.
[PE LV.TH] 4.8V
Press the [C] key.
Remove the label from the sensor detection area. The value for no paper state is displayed.
Holding the [RESTART] key down until an asterisk (*) is displayed. (More than 3 seconds.)
[PE LV.TH] 4.8V*
(See NOTE 2.)
Press the [↓] key twoce.
Indicates the adjustment is complete.
Press the [C] key .
Label
Backing paper
Feed Gap Sensor
* Align the backing paper of the TEC specified label with the feed gap sensor.

NOTES: *1. Be sure to adjust the feed gap sensor using the backing paper with no label as a criterion. Though an adjustment can be performed with the label, it could cause a paper jam error.*

*2. Pressing the **[↓]** key validates the sensor adjustment. The value of the sensor is displayed up to 5.0 V.*

6.6 SENSOR SETTING MODE (When using the operation panel)



(1) Turn the power OFF.

(2) Set the DIP switches to enter the manual threshold setting mode.
(3) Turn the power ON while pressing and holding the **[FEED]** key.

(4) The printer enters the sensor setting mode.
(5) Adjust the black mark sensor.
Set the tag paper so that the sensor can detect the white part of the paper.
(6) Press and hold the **[PAUSE]** key for 3 seconds or more.

(7) The power LED blinks when the black mark sensor adjustment is completed.

(8) Press the **[FEED]** key.

(9) Adjust the feed gap sensor.
Remove a few labels from the label roll and set it so that the sensor can detect the backing paper.
(10) Press and hold the **[PAUSE]** key for 3 seconds or more.
(11) The online LED blinks when the feed gap sensor adjustment is completed.

(12) Press the **[FEED]** key.

(13) Enter the sensor settings. (Enter the paper end.)
Remove the paper from the printer.

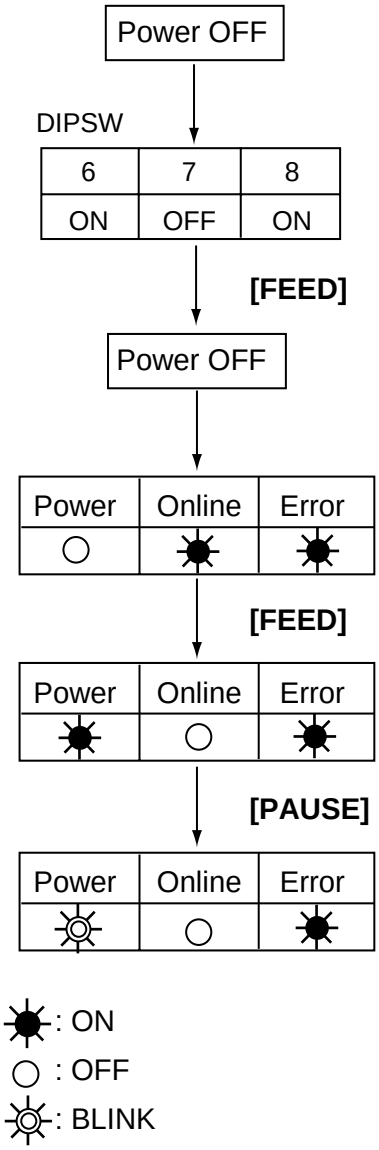
(14) Press and hold the **[PAUSE]** key for 3 seconds or more.
(15) The power LED and online LED blinks when the two sensors entry is completed.

(16) Turn the power OFF.

(17) Set the DIP switches to original position.

6.7 THRESHOLD SETTING (When using the operation panel)

For the printer to maintain a constant print position it uses the transmissive sensor to measure the amount of light passing through the gap between labels. When the paper is pre-printed, the darker (or more dense) inks can interfere with this process causing paper jam errors. To eliminate this problem a minimum threshold can be set for the sensor in the following way.



(1) The power is off.

(2) Set the DIP switches to enter the manual threshold setting mode.

(3) Turn the power ON while pressing and holding the **[FEED]** key.

The transmissive sensor is selected.

(4) Press the **[FEED]** key.

The reflective sensor is selected.
The sensor type is switched by pressing the **[FEED]** key. Load the pre-printed label roll in the usual way.

(5) Press and hold the **[PAUSE]** key.
The paper will feed through the printer until the **[PAUSE]** key is released. Release the **[PAUSE]** key after more than 1.5 labels have been fed.
(Threshold setting is completed by this operation. In case of the transmissive sensor threshold setting, the ONLINE LED blinks).

(6) Turn the power OFF.

(7) Set the DIP switches to original position.

NOTES: *1. To set the threshold properly, be sure to feed more than 1.5 labels. Insufficient paper feeding may result in an incorrect threshold setting. In this case, repeat the procedure.*
*2. While the print head is raised, the **[PAUSE]** key does not work.*
3. If the paper runs out or a cutter error occurs, it will not be detected during the paper feed.
4. If the printer does not print in the correct position even after the threshold setting, the transmissive sensor adjustment may be wrong. In this case, re-adjust the transmissive sensor, and then set the threshold again. (When the backing paper is thick, the transmissive sensor adjustment is required.)

6.8 RAM CLEAR MODE (When using the KB-80-QM Optional Keyboard)

In RAM clear mode, various data written on the EEP-ROM can be initialized. There are two clear functions; Maintenance counter clear and parameter clear in the parameter setting mode. After referring to the following table specify and clear or initialize the data.

■ RAM Clear Mode Table

<table>
<tr><th>Mode Name</th><th>Function</th></tr>
<tr><td>NO RAM CLEAR</td><td>If you enter the RAM clear mode by mistake, specify this mode to escape from the RAM clear mode without executing RAM clear.</td></tr>
<tr><td>MAINTE. COUNTER CLEAR</td><td>After replacing the print head, cutter module, ribbon feed/rewind motor, and CPU PC Board, clear the maintenance counter. The following data will be cleared to zero. Confirmation can be made through the maintenance counter procedure in self test mode. (See NOTE 1 and 2.)
<table>
<tr><th>Item</th><th>Initial Value</th></tr>
<tr><td>Paper distance covered</td><td>0 km</td></tr>
<tr><td>Print distance</td><td>0 km</td></tr>
<tr><td>Cut count</td><td>0 times</td></tr>
<tr><td>Ribbon Motor Drive time</td><td>0 hours</td></tr>
<tr><td>RS-232C hardware error count</td><td>0 times</td></tr>
<tr><td>System error count</td><td>0 times</td></tr>
<tr><td>Momentary power failure count</td><td>0 times</td></tr>
</table></td></tr>
<tr><td>PARAMETER CLEAR</td><td>This clear should be employed when initializing the following parameters to the settings before shipment. Confirmation can be made through the automatic diagnostic procedure in self test mode. (See NOTE 1 and 2.)
<table>
<tr><th>Item</th><th>Initial Value</th></tr>
<tr><td>Feed length fine adjustment (PC)</td><td>0 mm</td></tr>
<tr><td>Cut/strip position fine adjustment (PC)</td><td>0 mm</td></tr>
<tr><td>Back feed length fine adjustment (PC)</td><td>0mm</td></tr>
<tr><td>Print tone fine adjustment (Thermal Transfer) (PC)</td><td>0 step</td></tr>
<tr><td>Print tone fine adjustment (Thermal Direct) (PC)</td><td>0 step</td></tr>
<tr><td>Ribbon motor dirve voltage Fine Adjustment (PC)</td><td>0 step</td></tr>
<tr><td>Feed length fine adjustment (KEY)</td><td>0 mm</td></tr>
<tr><td>Cut/strip position fine adjustment (KEY)</td><td>0 mm</td></tr>
<tr><td>Back feed length fine adjustment (KEY)</td><td>0 mm</td></tr>
<tr><td>Print tone fine adjustment (Thermal Transfer) (KEY)</td><td>0 step</td></tr>
<tr><td>Print tone fine adjustment (Thermal Direct) (KEY)</td><td>0 step</td></tr>
<tr><td>Ribbon motor Drive voltage fine adjustment (KEY)</td><td>0 step</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Mode Name</th><th>Function</th></tr>
<tr><td>PARAMETER CLEAR</td><td>
<table>
<tr><th>Item</th><th>Initial Value</th></tr>
<tr><td>X axis fine adjustment</td><td>0 mm</td></tr>
<tr><td>Character code selection</td><td>PC-850</td></tr>
<tr><td>Font zero selection</td><td>“0” (without slash)</td></tr>
<tr><td>Code 5CH selection</td><td>“\”</td></tr>
<tr><td>Transmission control mode</td><td>XON + READY Auto mode</td></tr>
<tr><td>Control code selection</td><td>Auto</td></tr>
<tr><td>Strip wait status setting</td><td>OFF</td></tr>
<tr><td>Status response</td><td>ON</td></tr>
<tr><td>Threshold manual fine adjustment for the black mark sensor</td><td>1.0 V</td></tr>
<tr><td>Threshlod manual fine adjustment for the feed gap sensor</td><td>0.7 V</td></tr>
<tr><td>Label pitch</td><td>76.2 mm (B-452-TS)
104.8 mm (B-452-HS)</td></tr>
<tr><td>Effective printing length</td><td>74.2 mm (B-452-TS)
99.8 mm (B-452-HS)</td></tr>
<tr><td>Effective printing width</td><td>105.7 mm (B-452-TS)
103.6 mm (B-452-HS)</td></tr>
<tr><td>Sensor type</td><td>Transmissive sensor (Feed gap sensor)</td></tr>
<tr><td>Feed speed</td><td>2 inch/sec.</td></tr>
<tr><td>Issue mode</td><td>Standard (Batch printing)</td></tr>
<tr><td>PC save automatic calling</td><td>ON</td></tr>
<tr><td>Kanji code selection</td><td>Type 1</td></tr>
<tr><td>Feed speed adjustment value (on the PC)</td><td>0%</td></tr>
<tr><td>Feed speed adjustment value (on the printer)</td><td>0%</td></tr>
<tr><td>Euro code</td><td>B0H</td></tr>
<tr><td>True type font block</td><td>Not initialized</td></tr>
<tr><td>PC Save BLOCK</td><td>Not initialized</td></tr>
<tr><td>Bitmap writable character BLOCK</td><td>Not initialized</td></tr>
</table>
</td></tr>
</table>

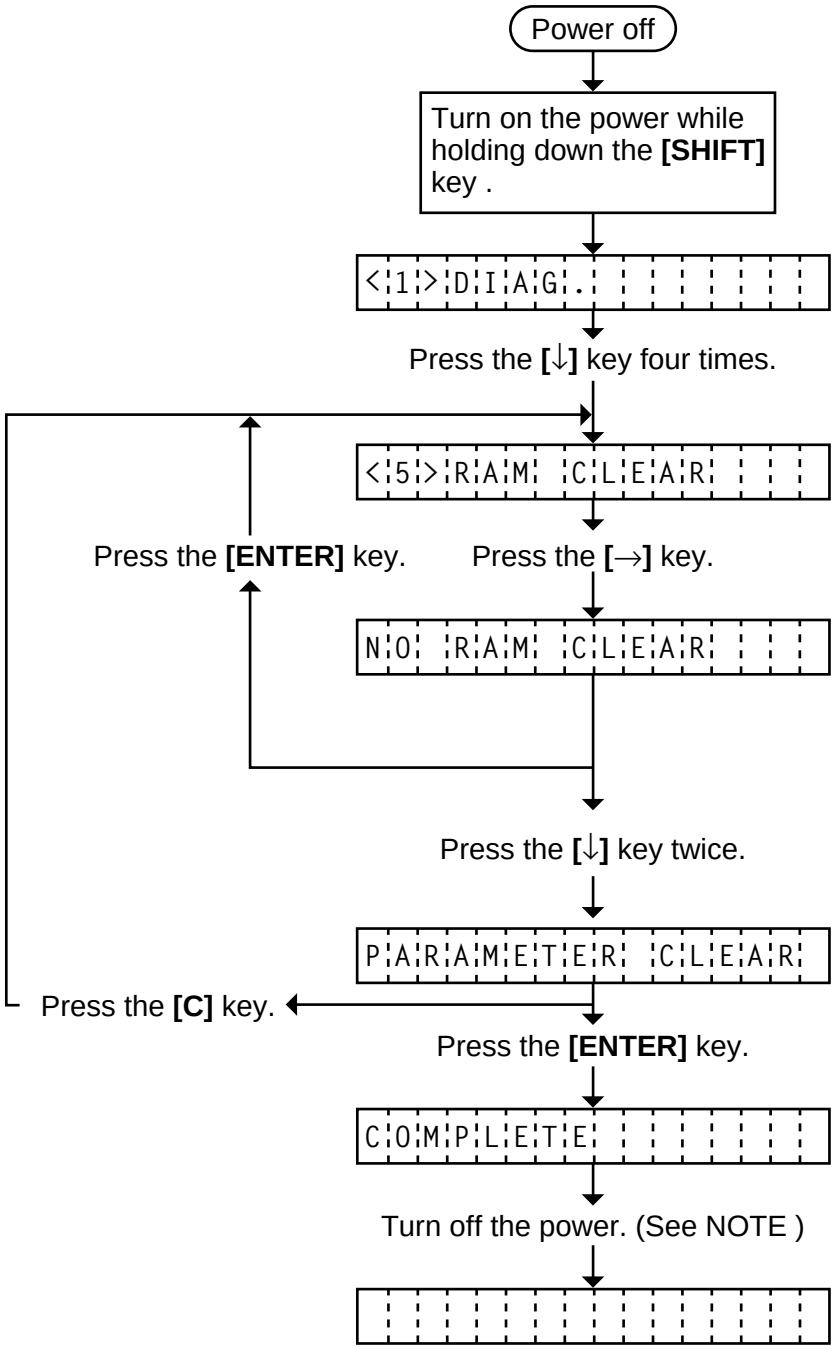
NOTES: *1. Total paper distance covered (TL FEED) and the adjustment value for the sensors cannot be cleared.*

2. Data stored on the flash memory card cannot be cleared with this procedure. To clear data on the flash memory card, send the format command to ini tialize the card. For details, refer to the Expansion I/O Interface Specification.

3. For data to be cleared in the RAM clear mode, refer to the RAM clear mode table.

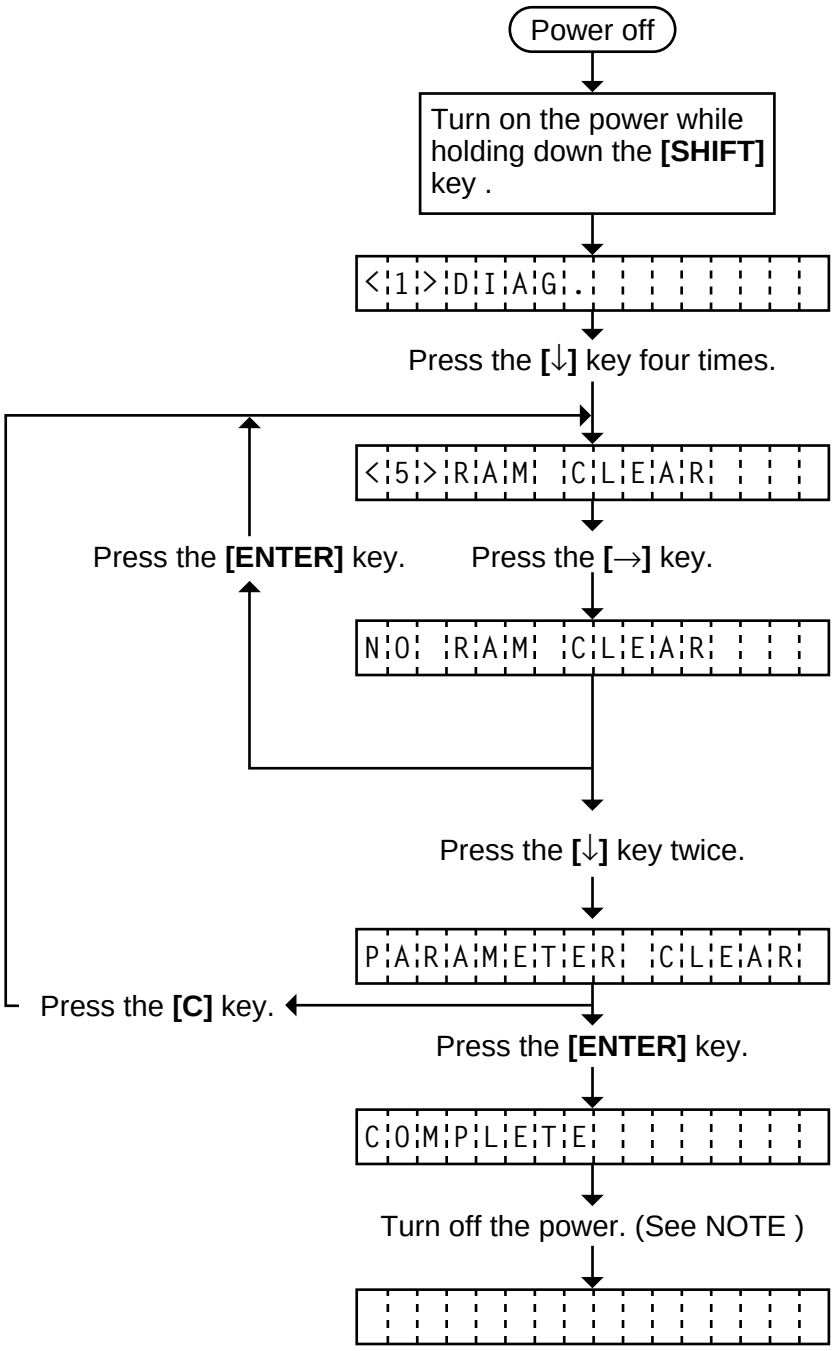
4. After RAM clear is performed, the threshold setting value will turn to the default (0). When using pre-printed labels, be sure to set the threshold after referring to the Owner’s Manual.

6.8.1 Maintenance Counter Clear


Power off
Turn on the power while holding down the [SHIFT] key .
<1>DIAG.
Press the [↓] key four times.
<5>RAM CLEAR
Press the [ENTER] key.
Press the [→] key.
NO RAM CLEAR
Press the [↓] key twice.
PARAMETER CLEAR
Press the [C] key.
Press the [ENTER] key.
COMPLETE
Turn off the power. (See NOTE)

NOTE: *Confirm that "COMPLETE" is displayed, then turn the power off.*

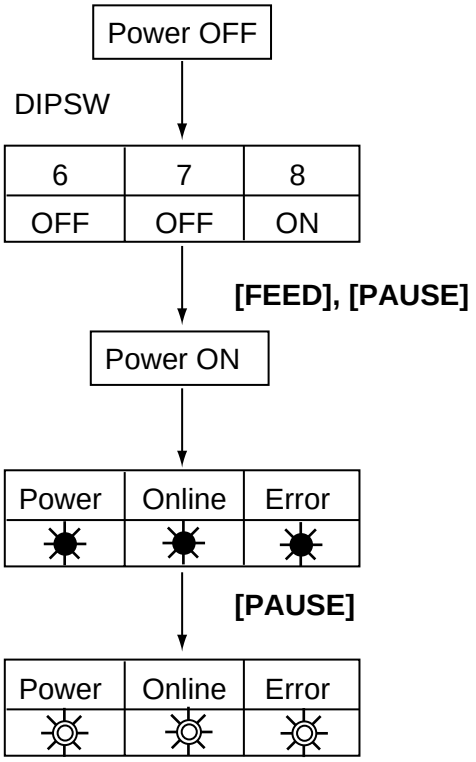
6.8.2 Parameter Clear


Power off
Turn on the power while holding down the [SHIFT] key .
<1>DIAG.
Press the [↓] key four times.
<5>RAM CLEAR
Press the [ENTER] key.
Press the [→] key.
NO RAM CLEAR
Press the [↓] key twice.
PARAMETER CLEAR
Press the [C] key.
Press the [ENTER] key.
COMPLETE
Turn off the power. (See NOTE)

NOTE: *Confirm that "COMPLETE" is displayed, then turn the power off.*

6.9 RAM CLEAR MODE (When using the operation panel)

6.9.1 Maintenance Counter Clear



(1) Turn the power OFF.

(2) Set the DIP switches to enter the maintenance counter clear mode.

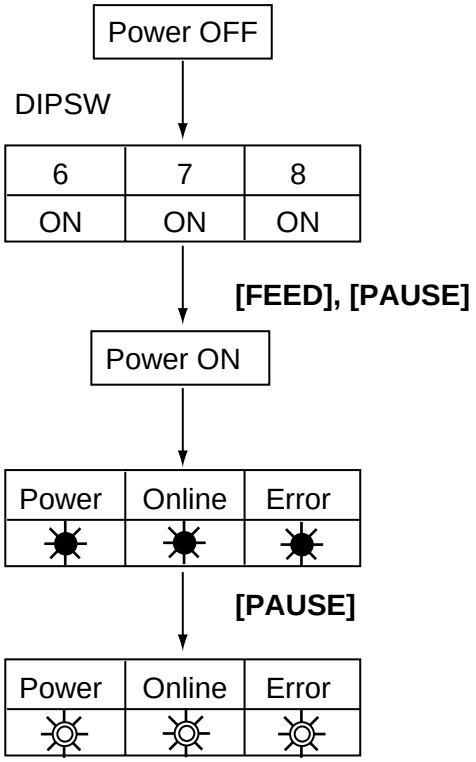
(3) Turn the power ON while pressing and holding the **[FEED]** and **[PAUSE]** keys.

(4) The printer enters the RAM clear mode.

(5) Perform the RAM clear, by holding **[PAUSE]** key.

(6) The RAM clear is completed, when all 3 LED's blinks.
(7) Turn the power OFF.
(8) Set the DIP Switches to original position.

6.9.2 Parameter Clear



(1) Turn the power OFF.

(2) Set the DIP switches to enter the parameter clear mode.

(3) Turn the power ON while pressing and holding the **[FEED]** and **[PAUSE]** keys.

(4) The printer enters the RAM clear mode.

(5) Perform the RAM clear, by holding **[PAUSE]** key.

(6) The RAM clear is completed, when all 3 LED's blinks.

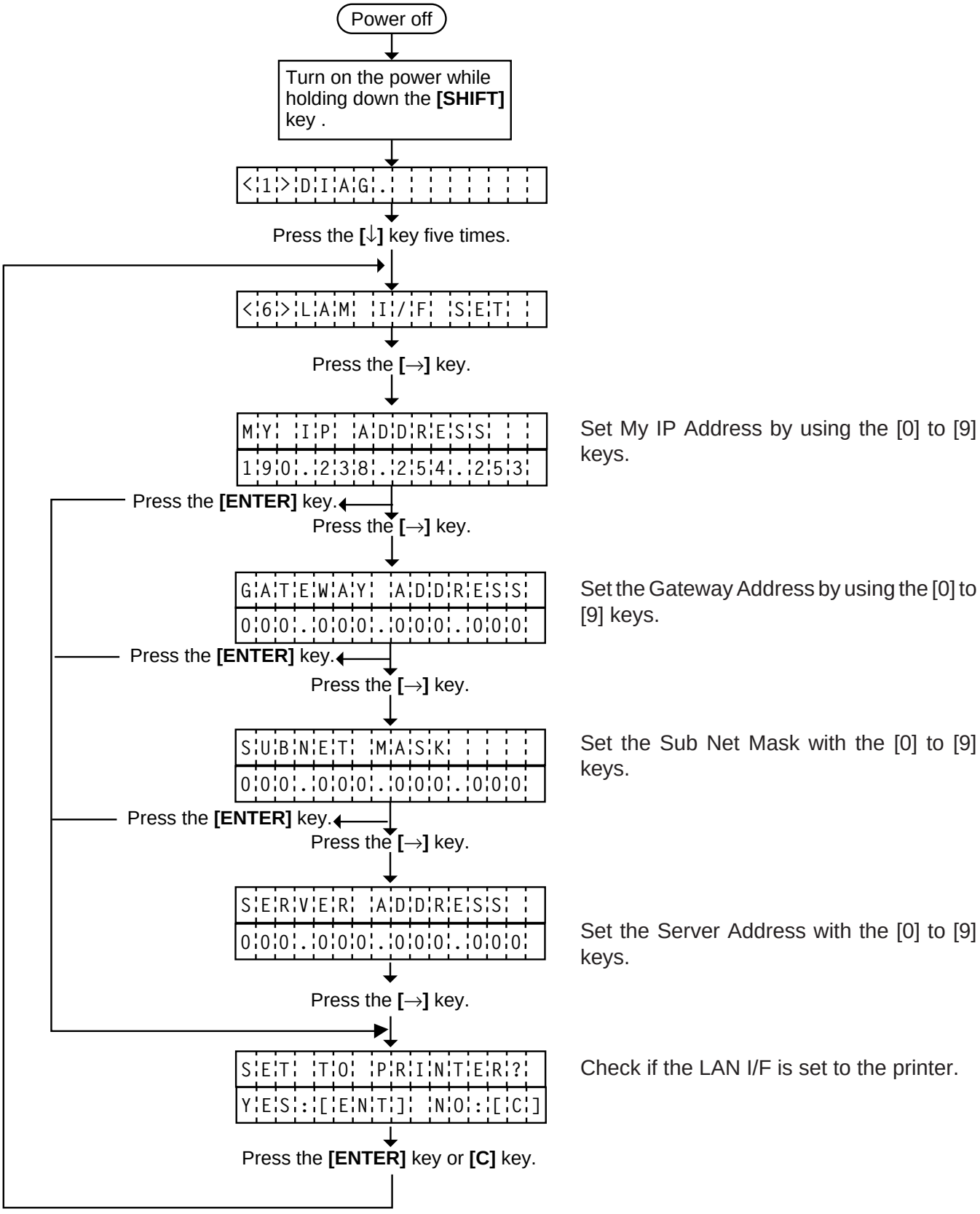
(7) Turn the power OFF.
(8) Set the DIP Switches to original position.

NOTE: *Regarding the details of the maintenance counter and parameter settings after RAM clear, refer to section 6.8 RAM CLEAR MODE.*

: ON
○ : OFF
: BLINK

6.10 LAN I/F SETTING MODE (When using the KB-80-QM optional keyboard)

Each address setting of LAN I/F (The following operations can be performed when the LAN I/F PC board is installed to the printer.) is available in this mode.

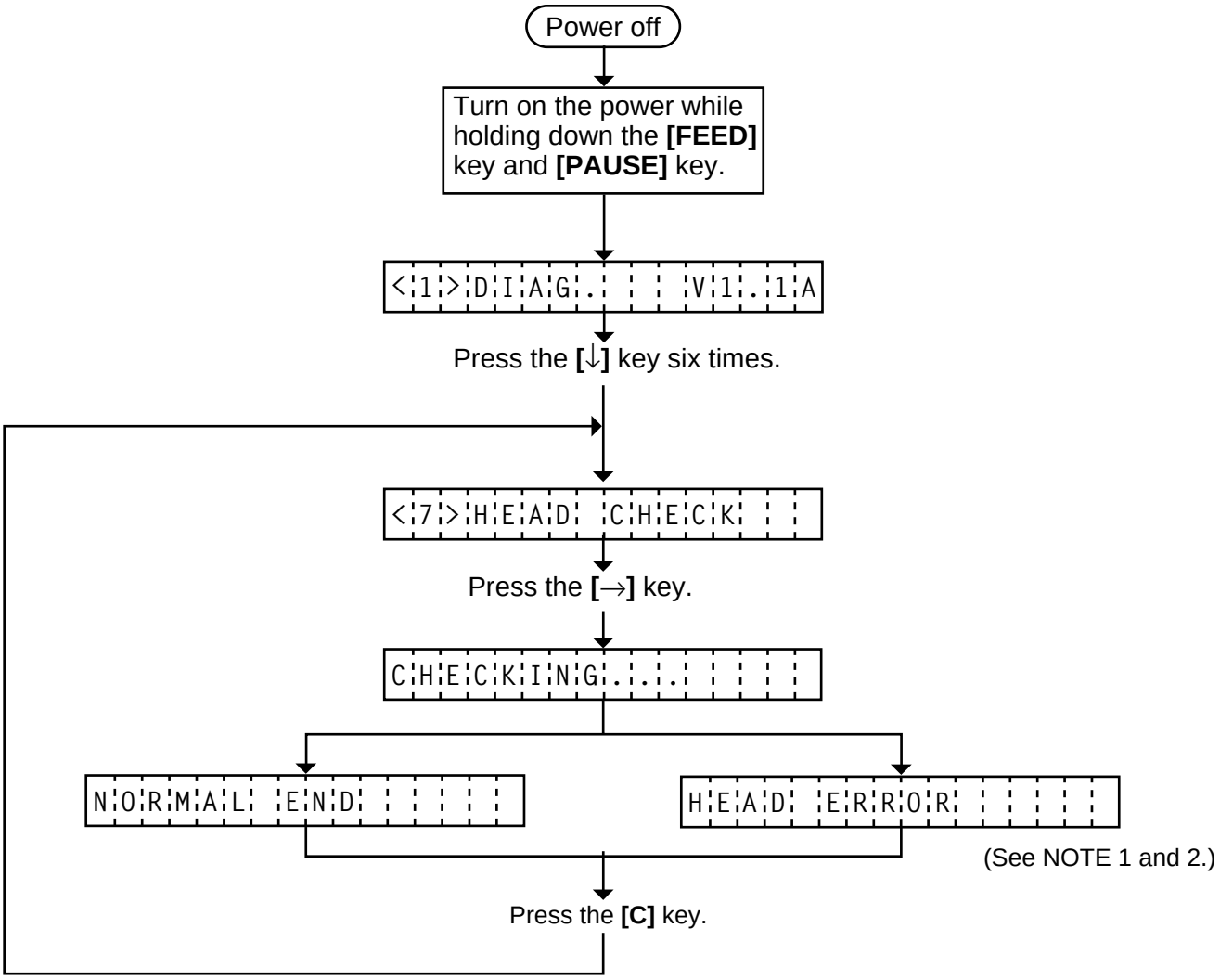

Power off
Turn on the power while holding down the [SHIFT] key .
<1>DIAG.
Press the [↓] key five times.
<6>LAM I/F SET
Press the [→] key.
MY IP ADDRESS
190.238.254.253
Press the [ENTER] key.
Press the [→] key.
GATEWAY ADDRESS
000.000.000.000
Press the [ENTER] key.
Press the [→] key.
SUBNET MASK
000.000.000.000
Press the [ENTER] key.
Press the [→] key.
SERVER ADDRESS
000.000.000.000
Press the [→] key.
SET TO PRINTER?
YES:[ENT] NO:[C]
Press the [ENTER] key or [C] key.
Set My IP Address by using the [0] to [9] keys.
Set the Gateway Address by using the [0] to [9] keys.
Set the Sub Net Mask with the [0] to [9] keys.
Set the Server Address with the [0] to [9] keys.
Check if the LAN I/F is set to the printer.

■ LAN I/F Initial Setting before shipment

Parameter	Initial
Operation Mode	Socket Mode
Data format for socket communication	Transparent Clear the receive buffer at connection.
My IP Address (Common)	190.238.254.254
Sub Net mask (Common)	0.0.0.0 (Not Used)
Gateway IP Address (Common)	0.0.0.0 (Not Used)
TCP Port No. for communication by RS-232C I/F	1111
TCP Port No. for communication by Centronics I/F	2222
Client Connection	Enable (Used)
Server IP Address	0.0.0.0 (Not Used)
TCP port No. of server	0 (Not Used)
RS-232C I/F Protocol	Baud Rate: 38400 bps Data Lengthe: 8 bits Parity : Even Stop Bit: 1 bit Protocol: XON/XOFF without flow control
Connection Retry count	10 times
Connection Trigger	Connected by the receive data. Disconnected by the timer.
Disconnection Timer value	90 seconds

6.11 HEAD BROKEN ELEMENT CHECK (B-452-HS MODEL)

The printer automatically performs the head broken element check. The result of the head broken element check is indicated in the display.



NOTES: *1. If the head broken element check results in 'HEAD ERROR', the print head must be replaced after referring to Section 2.4 Replacing the Print Head.*

2. After replacing the print head, clear the maintenance counter as described in Section 6.6.1 and perform a test print in Section 6.4 TEST PRINT MODE.

3. The B-452-TS model does not support this function. If this function is tried, the LCD will display "NOT SUPPORTED".

7. PROGRAM DOWN LOAD FOR PRINTER

The program for the printer has been written onto the flash ROM. If the program is updated, due to the additional/change of the specification, download the program from the PC to the printer with download floppy disk and RS-232C interface or Centronics interface.

7.1 FLOPPY DISK

1) Media: 3.5 inch (2HD, 1.44 MB)
2) Program Disk: 1 disk (this floppy disk contains the main program to be written onto the printer and the tool program for download.) The system disk is provided for the printer.

7.2 SETUP

The transmission control code must be set to either automatic selection or manual selection ({,I,}).
You cannot perform a down load with any other control codes.
Refer to Section 6.3.10 Control Code Selection.

7.2.1 Connecting the Printer to the PC

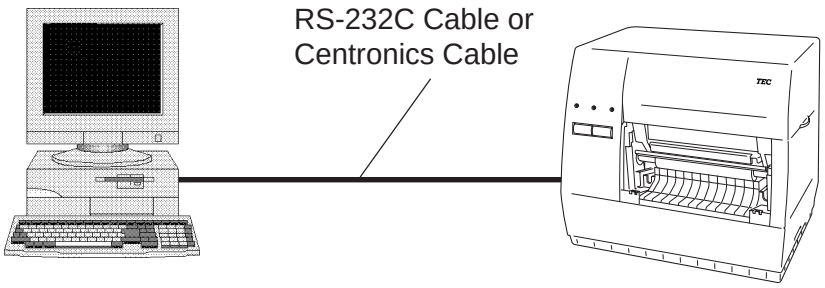


Fig. 7-1

•Windows 95 or later version
•Set the communication parameters as follows:
Baud rate: 9600 BPS
Parity: EVEN

7.2.2 Program Download FDK (3.5”, 2 HD, 1.44 MB)

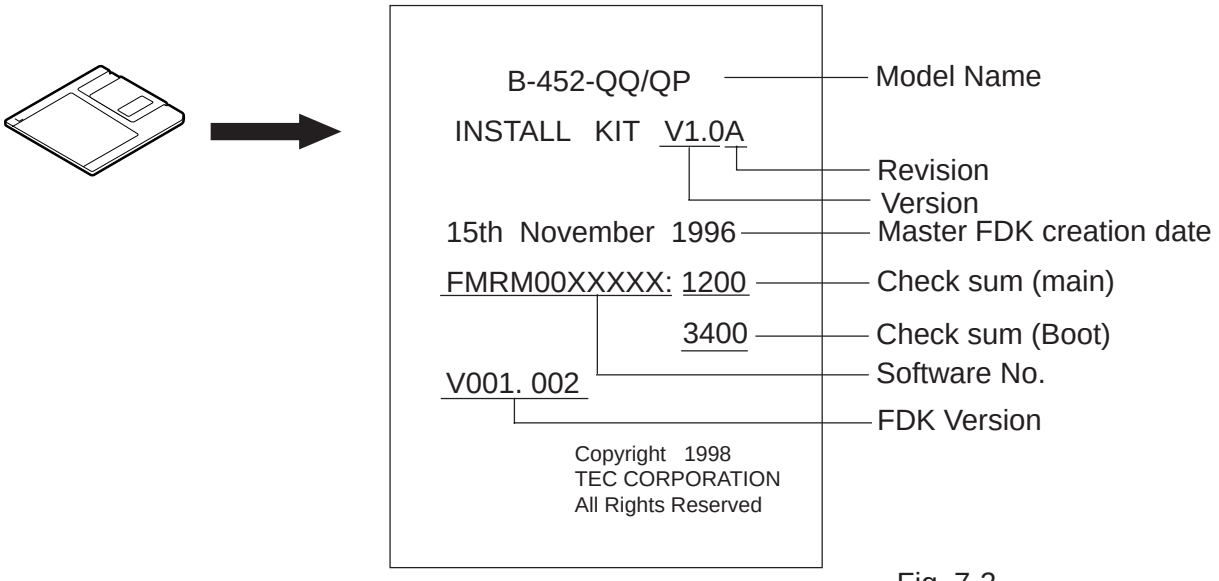
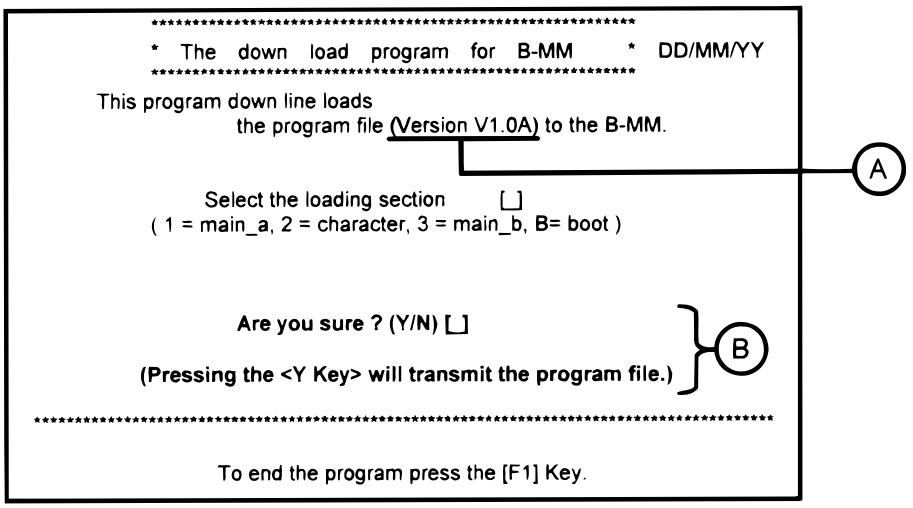


Fig. 7-2

7.3 DOWN LOAD PROCEDURE (DOS Version)

(1) Turn off the printer.
(2) Set the DIP switch #8 ON to enter the program download mode.
(3) Turn the PC power on.
(4) Turn the printer power on.
(5) Insert the program down load floppy disk into the PC.
(6) Change the drive to A. Type [A] [:] [↵]
(7) Start the exe file “BMMS”. Type [B] [M] [M] [S] [↵]
Or copy the contents of the floppy disk in to the hard disk and start the program in the hard disk.
(8) After starting the exe file “BMMS”, the following menu is displayed. Ⓐ indicates the main program version.


* The down load program for B-MM * DD/MM/YY
This program down line loads
the program file (Version V1.0A) to the B-MM.
A
Select the loading section [ ]
(1 = main_a, 2 = character, 3 = main_b, B= boot)
Are you sure ? (Y/N) [ ]
(Pressing the <Y Key> will transmit the program file.)
B
To end the program press the [F1] Key.

(9) Select the program.
(10) Start the program transmission. [Y] [↵]
(11) While the main program is being transmitted, the following message is displayed in line Ⓑ.

```
** Now transmitting (###/###KB)**
```

(12) When the transmission is successfully completed, the following message is displayed in line Ⓑ.

```
End of Transmission.  Continue (Y/N)  ?  [  ]
```

- To continue
  ① Turn the printer power off and exchange the printer with another one.
  ② Turn the printer power on.
  ③ Start the main program transmission. [Y] [↵]
- To terminate [N] [↵]

(13) When an error occurs, the following message is displayed together with the error code in line Ⓑ.

```
The following error occurred during transmission. (ERROR=##)
        Press any key to retry.
```

Error code

Doing so will revert to the displayed described in step (6). Refer to the error code to find the cause of the error. then retry the down load.

(14) Turn off the printer.

(15) Set the DIP switch #8 to off.

(16) After terminating the down load, refer to the Maintenance Manual Section 6.2 SELF TEST MODE and perform diagnostic printing. Check that the printer operates properly and the main program version and checksum is printed on the label.

7.4 ERROR CODE

Error Code (#)	Error	Remarks
06	Communication error (Error is detected during command analysis.)	Status from the printer
07	Communication error (Parity error, overrun error or framing error occurred during communication with RS-232C.)	
50	Write error occurred during formatting of the flash ROM.	
51	Delete error occurred while data was being written onto the flash ROM.	
57	Checksum error occurred in the transmission program data.	
88	Undefined status is received when a wating data in RS-232C.	Error detected in PC
90	A parameter error occurred.	
92	An overrun error occurred in RS-232C.	
93	A parity error occurred in RS-232C.	
94	A framing error occrred in RS-232C.	
95	A break is detected in RS-232C.	
97	COM1 open error occurred in RS-232C.	
98	Undefined status is received against the loading setup command.	
99	Undefined status is received when the loading operation is terminated.	

Check the following when an error occurs:

- The printer power is turned on.
- The RS-232C cable is connected properly.
- The DIP SW on the CPU PC board is set correctly.

7.5 DOWNLOAD PROCEDURE (WINDOWS Version)

1) Turn the PC power on.
2) While running Windows 95 or Windows 98, insert Setup Disk (1/2) into the PC floppy drive.
3) Click on the START button then highlight RUN and click on RUN.
4) When the RUN display appears, as in below, type in A: \setup and click on OK.

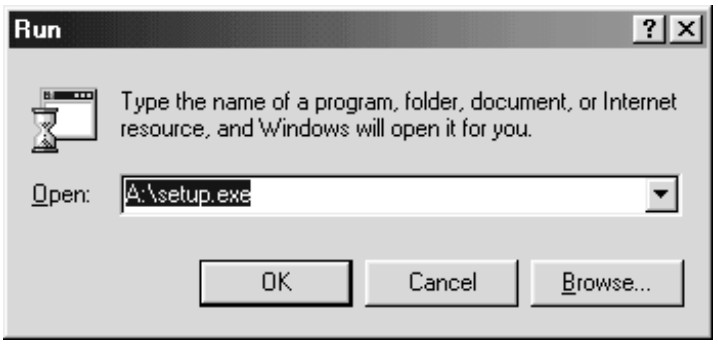


Fig. 7-3

5) When requested, insert Setup Disk (2/2).

Fig. 7-4

6) After all the files have been copied, the following message screen will automatically appear. Click on OK to continue.

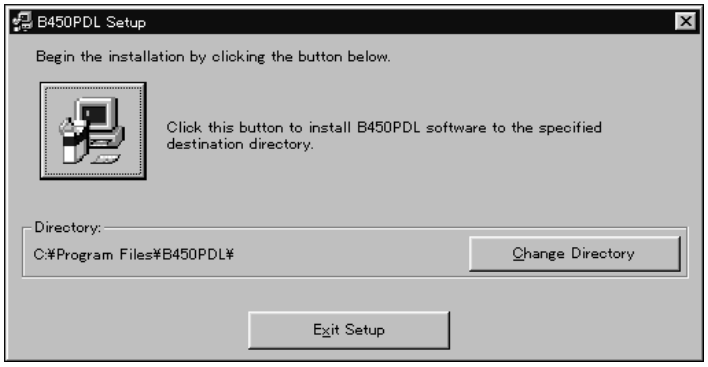

B450PDL Setup
Begin the installation by clicking the button below.
Click this button to install B450PDL software to the specified destination directory.
Directory:
C:¥Program Files¥B450PDL¥
Change Directory
Exit Setup

Fig. 7-5

7) After click OK in the previous screen, the following message screen appears. Click on the button to accept the directory or change the directory if desired.

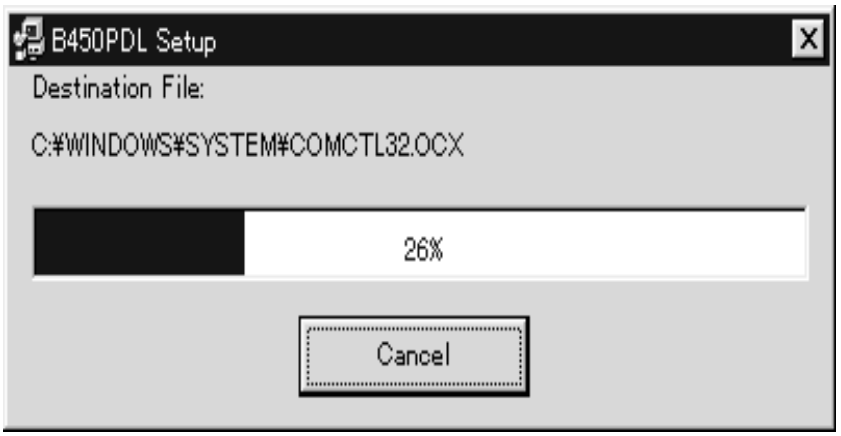


Fig. 7-6

8) When the install process is completed, the following screen display will appear. Click on the OK button to end the installation.

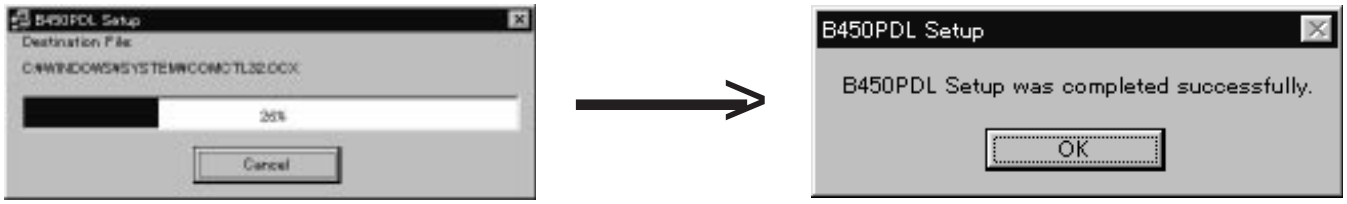


Fig. 7-7

9) Set the baud rate and parity to 9600 bps and EVEN, respectively (only for RS-232C Interface).
10) Connect the printer to the PC with the RS-232C cable or Centronics Cable.
11) Turn the printer power on.
12) Copy the binary file in the Program Download FDK to the directory of B450PDL. The directory is created in the Program Files as a default.
13) Click on the START button to access the program menu.
14) Highlight “Programs” then highlight “B450PDL” and click on install program for B-452 as shown in the screen display below.

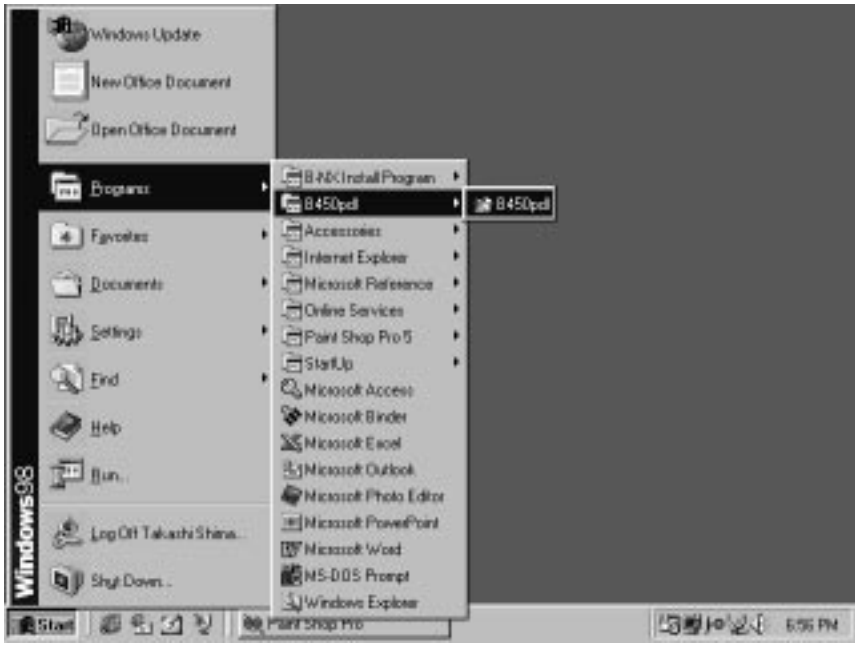


Fig. 7-8

15) **For B-452-TS model**

Select the download section and device.
For the RS-232C interface, select COM1 or COM2 port. For the centronics interface, select LPT1 port.

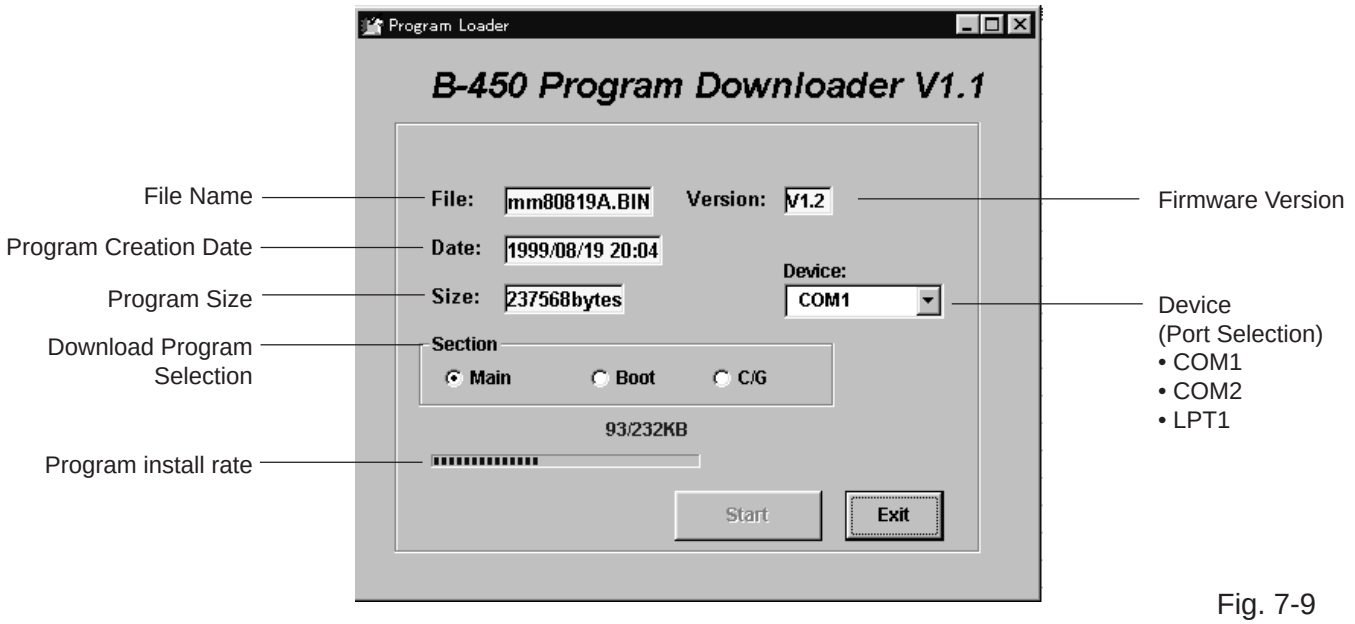


Fig. 7-9

FOR B-452-HS MODEL

Select the folder which contains the program to be downloaded.
Select the download section and device
For the RS-232C interface, select COM1 or COM2 port. For the centronics interface, select LPT1 port.

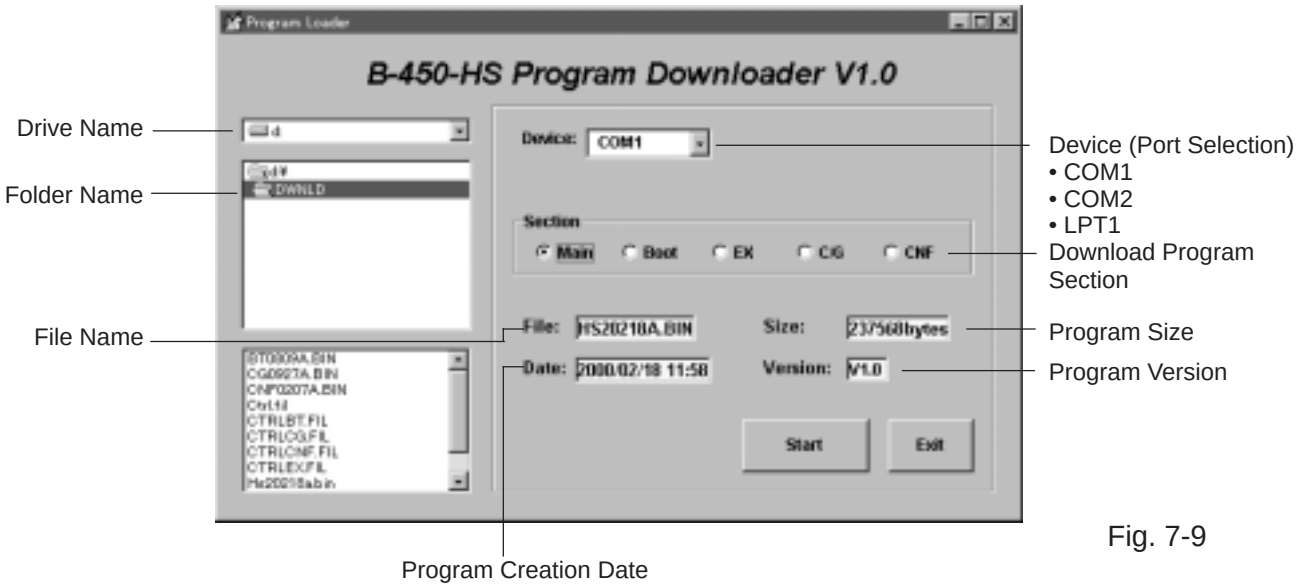
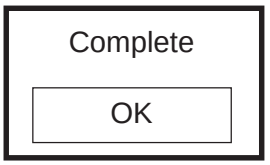


Fig. 7-9

16) Click on the [Start] button.

17) The program is downloaded to the PC.
18) When the download is completed successfully, “Complete” is displayed.



19) When the download failed, an error message is diplayed.

7.6 ERROR MESSAGE

When the download failed, the following error messages are displayed.

• Using the RS-232C Interface

Error Message	Error	Remarks
Command Error	Command error (Error is detected during command analsis.)	Status from the printer.
Printer COM Error	Communication error (Parity, overrun, or framing error occurred during communication.)	
Write Error	A write error occurred while data was being written onto the flash ROM.	
Erase Error	A delete error occurred while the flash ROM is formatted.	
Checksum Error	A checksum error occurred in the transmission program data.	
Printer Off	The printer power is OFF or the communication cable is not connected properly.	Status from the PC.
PC COM Error	A COM open error or hardware error occurred.	
Unknown Status	Undefined status was received.	

• Using the Centronics Interface

Error Message	Error	Remarks
Device Time Out	The printer power is OFF or the interface cable is not connected properly.	Status from the PC.
‘LPT1:’ Open Error!!	A LPT open error occurred.	Status from the PC.

8. PROGRAM DOWN LOAD FOR KEYBOARD

8.1 OUTLINE

The file loading loads (writes) BASIC program file or data file sent from the PC via an RS-232C cable to the flash memory. This section describes how to use the file loading.

8.2 SETUP

1) The KB-80-QM enters the downloading mode in the maintenance mode.
2) The loading preparation command is sent from the PC via an RS-232C port (D-SUB).
3) The loading data is sent.

Communication conditions

Communication speed:	19200BPS
Data length:	8 bit
Parity:	EVEN
Stop bit:	1 bit
Flow control:	None

8.3 BLOCK DIAGRAM FOR FILE LOADING (CONNECTION)

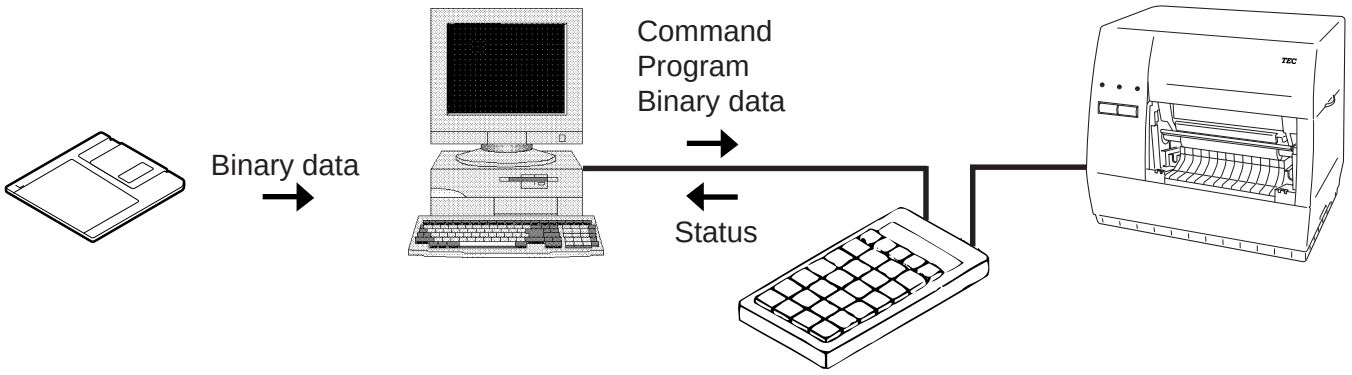


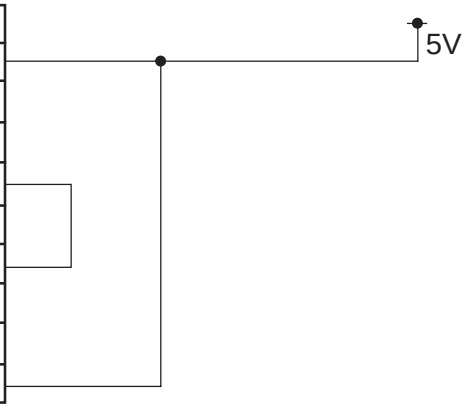
Fig. 8-1

1) Turn off the printer and your PC.
2) Connect the DIN cable of the KB-80-QM to the DIN connector of the B-450 printer.
3) Connect KB-80-QM and your PC with the serial cable (D-SUB).
4) Turn on the printer and your PC.

NOTE: *Pin configuration of KB-80-QM D-SUB connector:*

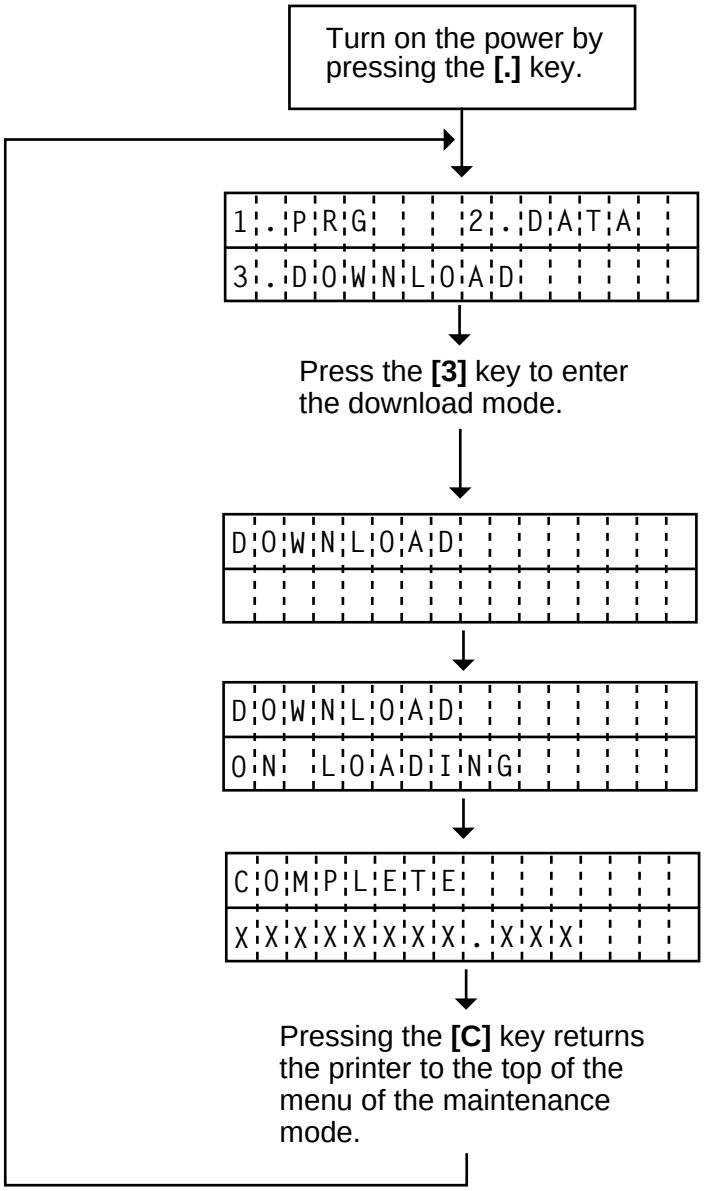
To PC KB-80-QM D-SUB female (Locking screw: inch)

Pin No.	Signal	I/O
1	---	---
2	TXD	Output
3	RXD	Input
4	---	---
5	GND	---
6	---	---
7	CTS	Input
8	RTS	Output
9	---	---



8.4 DOWN LOAD PROCEDURE

8.4.1 Program download mode


Turn on the power by pressing the [.] key.
1.PRG 2.DATA
3.DOWNLOAD
Press the [3] key to enter the download mode.
DOWNLOAD
DOWNLOAD
ON LOADING
COMPLETE
XXXXXXX.XXX
Pressing the [C] key returns the printer to the top of the menu of the maintenance mode.

The Loading Preparation Command is received. The display shows ON LOADING message.

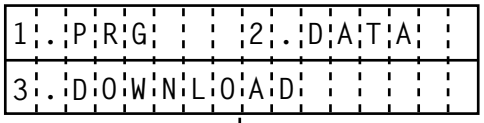
Loading is completed.
The display shows loading completion message and file name. If an error occurs, messages shown in the table below will be displayed.

NOTE: *Error message*

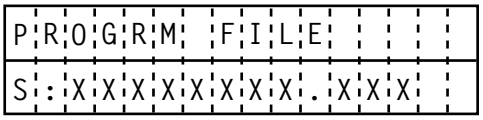
Message	Description
COMMAND ERROR	Communication command error
FILE SIZE OVER	File size out of range
ILLEGAL FILE No.	File No. out of range
DUPLICATE NAME	A file with the same name already exists. (Overwriting data is OK.)
WRITE ERROR	Write error of the flash memory
ERASE ERROR	Erase error of the flash memory

8.4.2 Program file maintenance mode (Deleting program files)

Turn on the power by pressing the **[.]** key.

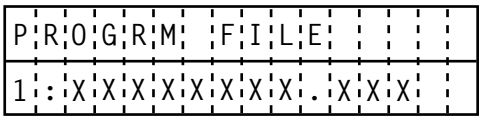


Press the **[1]** key to enter the program file maintenance mode.



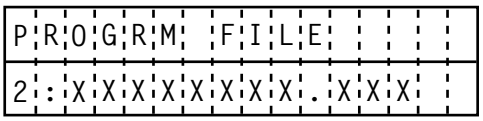
The display shows the file name of the system mode program.
(Note: System mode program file is unable to be deleted.)

Press the **[↓]** key and file name of program 1 will be displayed.

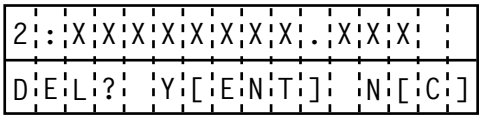


Perform the communication check by pressing the **[↓]** key.
File name of program 2 will be displayed.
Each time when the **[↓]** key is pressed, the file name of the next program will be displayed.

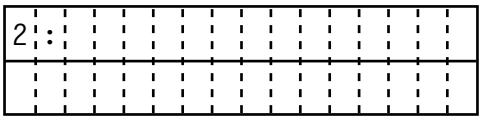
Press the **[↓]** key and File name of program 2 will be displayed.



Delete the file by pressing the **[C]** key.
Confirm that the deletion is executed.



Press the **[ENTER]** key to execute the deletion.



Pressing the **[↓]** key shows the next program file name.

8.5 DOWNLOAD PROCEDURE (WINDOWS Version)

1) Turn the PC power on.
2) While running Windows 95 or Windows 98, insert Setup Disk (1/2) into the PC floppy drive.
3) Click on the START button then highlight RUN and click on RUN.
4) When the RUN display appears, as in below, type in A: \setup and click on OK.

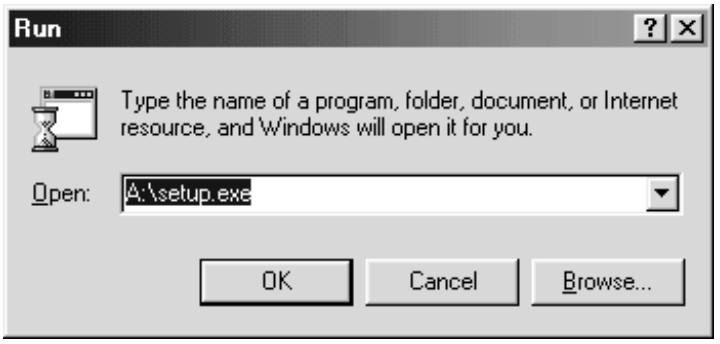


Fig. 8-2

5) When requested, insert Setup Disk (2/2).

Fig. 8-3

6) After all the files have been copied, the following message screen will automatically appear. Click on OK to continue.

kb80pdl for SE Setup
Welcome to the kb80pdl for SE installation program.
Setup cannot install system files or update shared files if they are in use. Before proceeding, we recommend that you close any applications you may be running.
OK
Exit Setup

Fig. 8-4

7) After click on OK in the previous screen, the following message screen appears.
Click on the button to accept the directory or change the directory if desired.

kb80pdl for SE Setup
Begin the installation by clicking the button below.
Click this button to install kb80pdl for SE software to the specified destination directory.
Directory:
C:¥Program Files¥kb80pdl for SE¥
Change Directory
Exit Setup

Fig. 8-5

8) The following program group selection screen appears.
If no change is required, click on the Continue button.

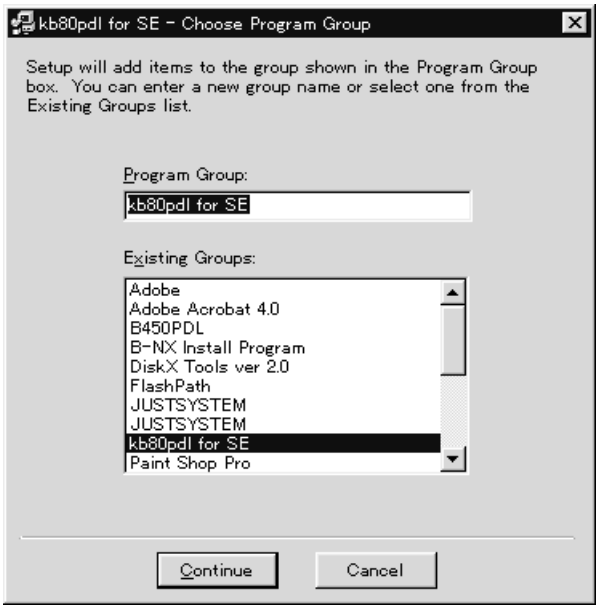


Fig. 8-6

9) When the install process is completed, the following screen display will appear.
Click on the OK button to end the installation.

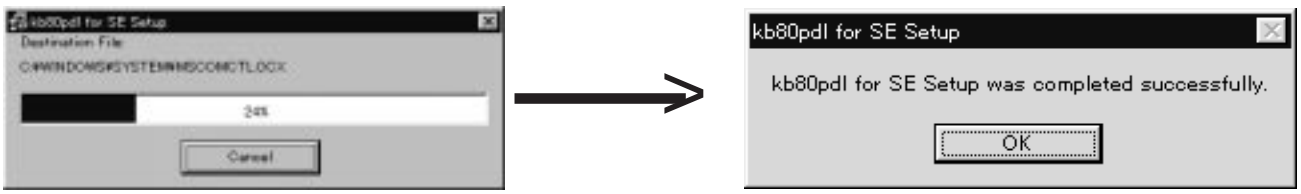


Fig. 8-7

10) Connect the printer to the PC with the RS-232C cable.
11) Turn the printer power on.
12) Copy the all files in the Program Download FDK to the directory of “kb80pdl for SE”. The directory is created in the Program Files as a default.
13) Click on the START button to access the program menu.
14) Highlight “Programs” then highlight “kb80pdl for SE” and click on install program for kb80pdl for SE as shown in the screen display below.

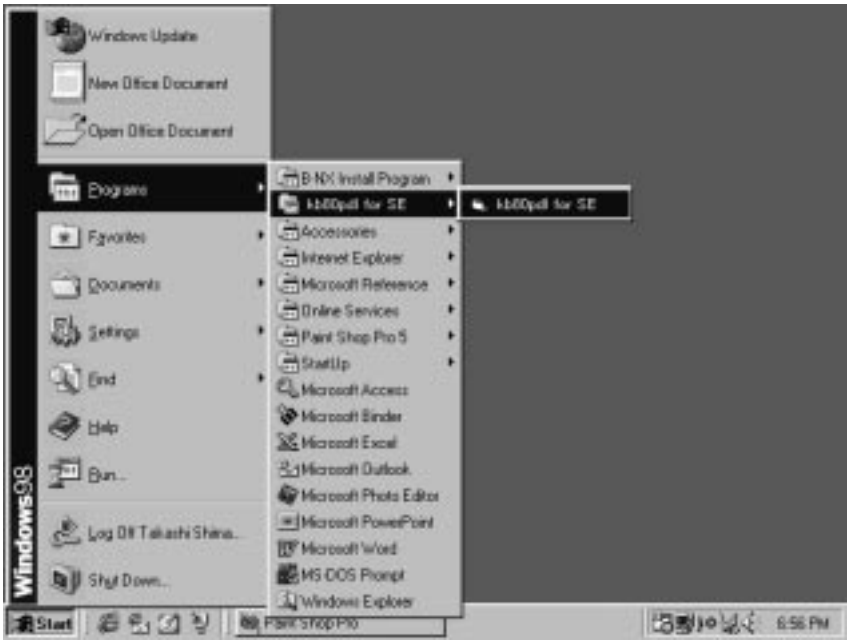


Fig. 8-8

15) Select the directory and download section.
16) Click on the [Start] button.

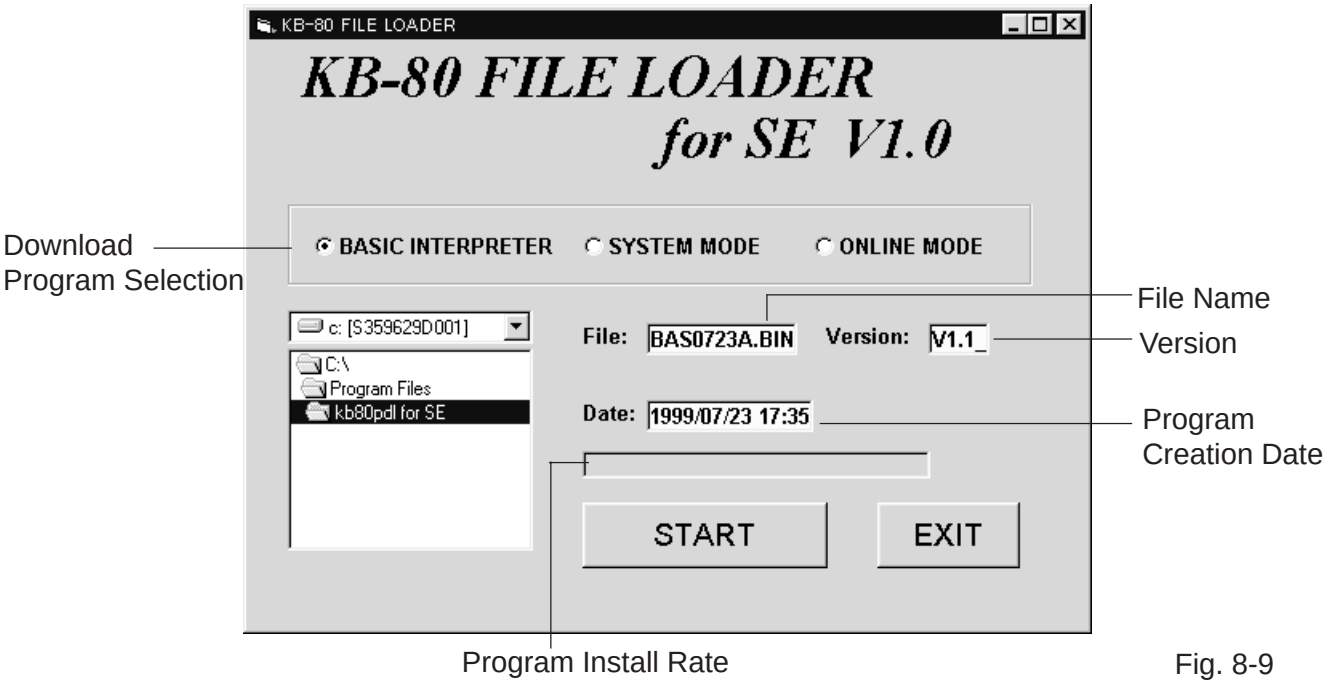


Fig. 8-9

17) The program is downloaded to the PC.
18) When the download is completed successfully, “Complete” is displayed.

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